N-Channel 100V, 9.5mΩ Typ. Power MOSFET

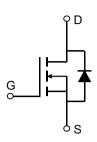
Description

Features

• 100V, 60A

 $R_{DS(ON)}$ Typ = 9.5m Ω @ V_{GS} = 10V

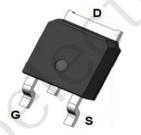
- Advanced Split Gate Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge
- 100% UIS TESTED!
- 100% ΔVds TESTED!





Application

- Load Switch
- PWM Application
- Power Management





Marking and Pin Assignment

Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMKGH1012A	CRMKGH1012A	TO-252-3L	TAPING	13"	2500	25000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		100	V
V _{GS}	Gate-to-Source Voltage		±20	V
I _D	Continuous Drain Current	T _C = 25°C	60	А
		T _C = 100°C	36	А
I _{DM}	Pulsed Drain Current (1)		240	А
E _{AS}	Single Pulsed Avalanche Energy (2)		90	mJ
P_{D}	Power Dissipation	T _C = 25°C	78	W
$R_{ heta JC}$	Thermal Resistance, Junction to Case		1.6	°C/W
T_J,T_STG	Junction & Storage Temperature Range		-55 to 150	°C

N-Channel 100V, $9.5m\Omega$ Typ. Power MOSFET

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Off Characteristics $V_{(BR)DSS} \text{Drain-Source Breakdown Voltage} \qquad I_D = 250 \mu \text{A}, \ V_{GS} = 0 \text{V} \qquad 100 \qquad - \qquad - \qquad \text{V} \\ I_{DSS} \text{Zero Gate Voltage Drain Current} \qquad V_{DS} = 100 \text{V}, \ V_{GS} = 0 \text{V} \qquad - \qquad - \qquad 1.0 \qquad \mu \text{A} \\ I_{GSS} \text{Gate-Body Leakage Current} \qquad V_{DS} = 0 \text{V}, \ V_{GS} = \pm 20 \text{V} \qquad - \qquad - \qquad \pm 100 \qquad \text{nA} \\ \text{On Characteristics} \\ V_{GS(th)} \text{Gate Threshold Voltage} \qquad V_{DS} = V_{GS}, \ I_D = 250 \mu \text{A} \qquad 2.4 \qquad 3 \qquad 3.6 \qquad \text{V} \\ \text{On Characteristics} \qquad \qquad \text{On Characteristics} \\ \text{On Characteristics} \qquad On Characte$, ,	<u> </u>				
$\begin{array}{c} V_{(BR)DSS} & Drain-Source Breakdown Voltage & I_D = 250 \mu A, \ V_{GS} = 0V & 100 & - & - & V \\ I_{DSS} & Zero Gate Voltage Drain Current & V_{DS} = 100V, \ V_{GS} = 0V & - & - & 1.0 & \mu A \\ I_{GSS} & Gate-Body Leakage Current & V_{DS} = 0V, \ V_{GS} = \pm 20V & - & - & \pm 100 & n A \\ \hline \\ On Characteristics & & & & & & \\ \hline V_{GS(Ph)} & Gate Threshold Voltage & V_{DS} = V_{GS}, \ I_D = 250 \mu A & 2.4 & 3 & 3.6 & V \\ \hline R_{DS(DN)} & Static Drain-Source ON-Resistance & V_{GS} = 10V, \ I_D = 30A & - & 9.5 & 12.3 & m \Omega \\ \hline \\ Dynamic Characteristics & & & & & & \\ \hline C_{ins} & Input Capacitance & V_{GS} = 10V, \ I_D = 30A & - & 9.5 & 12.3 & m \Omega \\ \hline \\ Dynamic Characteristics & & & & & & & \\ \hline C_{ins} & Input Capacitance & V_{GS} = 0V, \ V_{DS} = 50V, \ I_D = 30A & - & 9.5 & 12.3 & m \Omega \\ \hline \\ Dynamic Characteristics & & & & & & & & \\ \hline C_{ins} & Reverse Transfer Capacitance & V_{GS} = 0V, \ V_{DS} = 50V, \ I_D = 30A & - & 9.5 & 12.3 & m \Omega \\ \hline \\ Dynamic Characteristics & & & & & & & & \\ \hline C_{ins} & Reverse Transfer Capacitance & V_{GS} = 0V, \ V_{DS} = 50V, \ I_D = 20A, \ I_D = 20A & - & 28 & - & n C \\ \hline \\ Q_{gs} & Gate Source Charge & V_{GS} = 0 to 10V & - & 4.9 & - & n C \\ \hline Q_{gs} & Gate Drain ("Miller") Charge & V_{GS} = 50V, \ I_D = 20A & - & 7 & - & n C \\ \hline \\ Switching Characteristics & & & & & & \\ \hline t_{q(ori)} & Turn-On DelayTime & V_{GS} = 10V, \ V_{DD} = 50V & - & 17.0 & - & n S \\ \hline t_{q(ori)} & Turn-Off DelayTime & I_D = 20A, \ R_{GEN} = 6\Omega & - & 30 & - & n S \\ \hline t_{q(ori)} & Turn-Off Fall Time & - & 18 & - & n S \\ \hline \\ Drain-Source Diode Characteristics and Max Ratings & & & & & \\ \hline I_{SM} & Maximum Continuous Drain to Source Diode Forward Current & - & - & 60 & A \\ \hline I_{SM} & Maximum Pulsed Drain to Source Diode Forward Current & - & - & 240 & A \\ \hline V_{SD} & Drain to Source Diode Forward Voltage & V_{GS} = 0V, \ I_S = 30A & - & - & 1.2 & V \\ \hline trr & Body Diode Reverse Recovery Time & & & & & & & & \\ \hline I_{CD} & I_{CD} \\ \hline \\ I_{CD} & I_{CD} $	Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Off Chara	acteristics					
$\begin{array}{c} I_{\rm GSS} {\rm Gate-Body Leakage Current} V_{\rm DS} = 0V, V_{\rm GS} = \pm 20V - \pm 100 {\rm nA} \\ \hline \textbf{On Characteristics} \\ \hline V_{\rm GS(th)} {\rm Gate Threshold Voltage} V_{\rm DS} = V_{\rm GS}, \ I_{\rm D} = 250 \mu \text{A} 2.4 3 3.6 V \\ \hline \textbf{R}_{\rm DS(ON)} {\rm Static Drain-Source ON-Resistance}^{(3)} V_{\rm GS} = 10V, \ I_{\rm D} = 30A - 9.5 12.3 {\rm m}\Omega \\ \hline \textbf{Dynamic Characteristics} \\ \hline \textbf{C}_{\rm iss} {\rm Input Capacitance} V_{\rm GS} = 0V, \ V_{\rm DS} = 50V, \\ \hline \textbf{C}_{\rm oss} {\rm Output Capacitance} V_{\rm GS} = 0V, \ V_{\rm DS} = 50V, \\ \hline \textbf{C}_{\rm rss} {\rm Reverse Transfer Capacitance} V_{\rm GS} = 0V, \ V_{\rm DS} = 50V, \\ \hline \textbf{C}_{\rm rss} {\rm Reverse Transfer Capacitance} V_{\rm GS} = 0 \text{ to} 10V \\ \hline \textbf{C}_{\rm gs} {\rm Gate Source Charge} V_{\rm GS} = 0 \text{ to} 10V \\ \hline \textbf{C}_{\rm gs} {\rm Gate Drain("Miller") Charge} V_{\rm SS} = 0 \text{ to} 10V \\ \hline \textbf{C}_{\rm gg} {\rm Gate Drain("Miller") Charge} V_{\rm SS} = 50V, \ I_{\rm D} = 20A \\ \hline \textbf{C}_{\rm gg} {\rm Gate Drain("Miller") Charge} V_{\rm GS} = 50V, \ V_{\rm DS} = 50V \\ \hline \textbf{C}_{\rm gg} {\rm Turn-On DelayTime} V_{\rm GS} = 10V, \ V_{\rm DD} = 50V \\ \hline \textbf{C}_{\rm gg} {\rm Turn-On Rise Time} V_{\rm GS} = 10V, \ V_{\rm DD} = 50V \\ \hline \textbf{C}_{\rm gg} {\rm Turn-Off DelayTime} I_{\rm D} = 20A, \ R_{\rm GEN} = 6\Omega \\ \hline \textbf{C}_{\rm gg} {\rm Turn-Off Fall Time} {\rm Ins} {\rm Ins} \\ \hline \textbf{Drain-Source Diode Characteristics and Max Ratings} \\ \hline \textbf{I}_{\rm S} {\rm Maximum Pulsed Drain to Source Diode Forward Current} - - 60 A \\ \hline \textbf{I}_{\rm SM} {\rm Maximum Pulsed Drain to Source Diode Forward Current} - - 50 - {\rm ns} \\ \hline \textbf{I}_{\rm F} = 20A, \ {\rm didt} = 100A/us \\ \hline \textbf{C}_{\rm F} = 20A, \ {\rm didt} = 100A/us \\ \hline \end{tabular} - 50 - {\rm ns} \\ \hline \textbf{C}_{\rm GS} = 20A, \ {\rm didt} = 100A/us \\ \hline \end{tabular} - 50 - {\rm ns} \\ \hline \textbf{C}_{\rm GS} = 20A, \ {\rm didt} = 100A/us \\ \hline \end{tabular} - 50 - {\rm ns} \\ \hline \end{tabular} - 50 - {\rm ns} \\ \hline \end{tabular} - 50 - {\rm ns} \\ \hline \end{tabular} - - 50 - {\rm ns} \\ \hline tabul$	V _{(BR)DSS}	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	100	-	-	V
$\begin{array}{c} \textbf{On Characteristics} \\ \textbf{$V_{\text{GS}(m)}$} & \textbf{Gate Threshold Voltage} & \textbf{$V_{\text{DS}} = V_{\text{GS}}$, $I_{\text{D}} = 250 \mu \text{A}$} & \textbf{2.4} & \textbf{3} & \textbf{3.6} & \textbf{V} \\ \textbf{$R_{\text{DS}(ON)}$} & \textbf{Static Drain-Source ON-Resistance}^{(3)} & \textbf{$V_{\text{GS}} = 10V$, $I_{\text{D}} = 30A$} & - & 9.5 & 12.3 & m\Omega \\ \textbf{Dynamic Characteristics} \\ \textbf{C_{ISS}} & \text{Input Capacitance} & \textbf{$V_{\text{CS}} = 0V$, $V_{\text{DS}} = 50V$, $ & 558$ & - & pF \\ \textbf{C_{OSS}} & \text{Output Capacitance} & \textbf{$V_{\text{CS}} = 0V$, $V_{\text{DS}} = 50V$, $ & 558$ & - & pF \\ \textbf{C_{TSS}} & \text{Reverse Transfer Capacitance} & \textbf{$V_{\text{CS}} = 0V$, $V_{\text{DS}} = 50V$, $ & 558$ & - & pF \\ \textbf{Q_{G}} & \text{Total Gate Charge} & \textbf{$V_{\text{CS}} = 0 \text{ to } 10V$ & - & 4.9 & - & nC \\ \textbf{Q_{gS}} & \text{Gate Source Charge} & \textbf{$V_{\text{CS}} = 0 \text{ to } 10V$ & - & 4.9 & - & nC \\ \textbf{Q_{gS}} & \text{Gate Drain("Miller") Charge} & \textbf{$V_{\text{CS}} = 50V$, $I_{\text{D}} = 20A$} & - & 7 & - & nC \\ \textbf{Switching Characteristics} \\ \textbf{$t_{\text{d}(on)}$} & \text{Turn-On DelayTime} & \textbf{$V_{\text{CS}} = 10V$, $V_{\text{DD}} = 50V$ & - & 13.5$ & - & ns \\ \textbf{$t_{\text{d}(off)}$} & \text{Turn-Off DelayTime} & \textbf{$I_{\text{D}} = 20A$, $R_{\text{GEN}} = 6\Omega$} & - & 30 & - & ns \\ \textbf{t_{t}} & \text{Turn-Off Fall Time} & \textbf{$I_{\text{D}} = 20A$, $R_{\text{GEN}} = 6\Omega$} & - & 30 & - & ns \\ \textbf{t_{T}} & \text{Turn-Off DelayTime} & \textbf{$I_{\text{D}} = 20A$, $R_{\text{GEN}} = 6\Omega$} & - & 30 & - & ns \\ \textbf{t_{S}} & \text{Maximum Continuous Drain to Source Diode Forward Current} & - & - & 60 & A \\ \textbf{I_{SM}} & \text{Maximum Pulsed Drain to Source Diode Forward Current} & - & - & 240 & A \\ \textbf{V_{SD}} & \text{Drain to Source Diode Forward Voltage} & \textbf{$V_{\text{GS}} = 0V$, $I_{\text{S}} = 30A$} & - & - & 1.2 & V \\ \text{trr} & \text{Body Diode Reverse Recovery Time} & \textbf{$I_{\text{E}} = 20A$, $di/dt = 100Avus} & - & 50 & - & ns \\ \textbf{$I_{\text{E}} = 20A$, $di/dt = 100Avus} & - & 50 & - & ns \\ \textbf{$I_{\text{E}} = 20A$, $di/dt = 100Avus} & - & 50 & - & ns \\ \textbf{$I_{\text{E}} = 20A$, $di/dt = 100Avus} & - & 50 & - & - & 50 \\ \textbf{$I_{\text{E}} = 20A$, $di/dt = 100Avus} & - & 50 & - & - & - & 50 \\ \textbf{$I_{\text{E}} = 20A$, di/dt	I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1.0	μΑ
$\begin{array}{c} V_{GS(\text{in})} \text{Gate Threshold Voltage} \qquad V_{DS} = V_{GS}, \ I_D = 250 \mu\text{A} \qquad 2.4 \qquad 3 \qquad 3.6 \qquad V \\ R_{DS(\text{ON})} \text{Static Drain-Source ON-Resistance}^{(3)} V_{GS} = 10V, \ I_D = 30A \qquad - \qquad 9.5 \qquad 12.3 \qquad \text{m}\Omega \\ \hline \textbf{Dynamic Characteristics} \\ \hline C_{Iss} \text{Input Capacitance} \qquad & - \qquad 1176 \qquad - \qquad pF \\ C_{Oss} \text{Output Capacitance} \qquad & V_{GS} = 0V, \ V_{DS} = 50V, \\ C_{rss} \text{Reverse Transfer Capacitance} \qquad & - \qquad 558 \qquad - \qquad pF \\ C_{rss} \text{Reverse Transfer Capacitance} \qquad & - \qquad 7.6 \qquad - \qquad pF \\ Q_g \text{Total Gate Charge} \qquad & - \qquad 28 \qquad - \qquad nC \\ Q_{gs} \text{Gate Source Charge} \qquad & V_{GS} = 0 \text{ to } 10V \\ V_{DS} = 50V, \ I_D = 20A \qquad - \qquad 7 \qquad - \qquad nC \\ \hline \textbf{Switching Characteristics} \\ \hline t_{d(on)} \text{Turn-On DelayTime} \qquad & - \qquad 13.5 \qquad - \qquad ns \\ t_r \text{Turn-On Rise Time} \qquad & V_{GS} = 10V, \ V_{DD} = 50V \qquad - \qquad 17.0 \qquad - \qquad ns \\ t_{d(off)} \text{Turn-Off DelayTime} \qquad & I_D = 20A, \ R_{GEN} = 6\Omega \qquad - \qquad 30 \qquad - \qquad ns \\ \hline \textbf{t}_r \text{Turn-Off Fall Time} \qquad & - \qquad 18 \qquad - \qquad ns \\ \hline \textbf{Drain-Source Diode Characteristics and Max Ratings} \\ \hline \textbf{I}_S \text{Maximum Continuous Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 60 \qquad A \\ \hline \textbf{I}_{SM} \text{Maximum Pulsed Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 240 \qquad A \\ \hline \textbf{V}_{SD} \text{Drain to Source Diode Forward Voltage} \qquad V_{GS} = 0V, \ I_S = 30A \qquad - \qquad - \qquad 1.2 \qquad V \\ \hline \text{trr} \text{Body Diode Reverse Recovery Time} \qquad \qquad I_F = 20A, \ di/dt = 100A/us \\ \hline \textbf{I}_F = 20A, \ di/dt = 100A/us \\ \hline \end{tabular} \qquad \qquad$	I _{GSS}	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
$R_{DS(ON)} \text{Static Drain-Source ON-Resistance}^{(3)} V_{GS} = 10V, \ I_D = 30A \qquad - 9.5 \qquad 12.3 \qquad \text{m}\Omega$ $ \text{Dynamic Characteristics} $ $ C_{Iss} \text{Input Capacitance} \qquad V_{GS} = 0V, \ V_{DS} = 50V, \qquad - 558 \qquad - pF$ $ C_{Oss} \text{Output Capacitance} \qquad V_{GS} = 0V, \ V_{DS} = 50V, \qquad - 558 \qquad - pF$ $ C_{rss} \text{Reverse Transfer Capacitance} \qquad - 7.6 \qquad - pF$ $ Q_g \text{Total Gate Charge} \qquad V_{GS} = 0 \text{ to } 10V \qquad - 4.9 \qquad - nC$ $ Q_{gs} \text{Gate Source Charge} \qquad V_{OS} = 50V, \ I_D = 20A \qquad - 7 \qquad - nC$ $ Switching \text{Characteristics} $ $ t_t \text{Turn-On DelayTime} \qquad - 13.5 \qquad - ns$ $ t_t \text{Turn-On Rise Time} \qquad V_{GS} = 10V, \ V_{DD} = 50V \qquad - 17.0 \qquad - ns$ $ t_{d(off)} \text{Turn-Off BelayTime} \qquad I_D = 20A, \ R_{GEN} = 6\Omega \qquad - 30 \qquad - ns$ $ t_t \text{Turn-Off Fall Time} \qquad - 18 \qquad - ns$ $ \text{Drain-Source Diode Characteristics and Max Ratings} $ $ I_S \text{Maximum Continuous Drain to Source Diode Forward Current} \qquad - 60 \qquad A$ $ I_{SM} \text{Maximum Pulsed Drain to Source Diode Forward Current} \qquad - 240 \qquad A$ $ V_{SD} \text{Drain to Source Diode Forward Voltage} V_{GS} = 0V, \ I_S = 30A \qquad - 1.2 \qquad V$ $ \text{trr} \text{Body Diode Reverse Recovery Time} \qquad I_F = 20A, \ \text{di/dt} = 100A/us} \qquad - 50 \qquad - ns$	On Chara	acteristics				6	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	2.4	3	3.6	V
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	$V_{GS} = 10V, I_D = 30A$	-	9.5	12.3	mΩ
$ \begin{array}{c} C_{oss} \text{Output Capacitance} \qquad V_{GS} = 0V, \ V_{DS} = 50V, \\ f = 1 \text{MHz} \qquad - 558 \qquad - pF \\ C_{rss} \text{Reverse Transfer Capacitance} \qquad - 7.6 \qquad - pF \\ Q_g \text{Total Gate Charge} \qquad - 28 \qquad - nC \\ Q_{gs} \text{Gate Source Charge} \qquad V_{GS} = 0 \text{ to } 10V \qquad - 4.9 \qquad - nC \\ Q_{gd} \text{Gate Drain("Miller") Charge} \qquad - 7 \qquad - nC \\ \textbf{Switching Characteristics} \\ \textbf{t}_{d(on)} \text{Turn-On DelayTime} \qquad - 13.5 \qquad - ns \\ \textbf{t}_{r} \text{Turn-On Rise Time} \qquad V_{GS} = 10V, \ V_{DD} = 50V \qquad - 17.0 \qquad - ns \\ \textbf{t}_{d(off)} \text{Turn-Off DelayTime} \qquad I_{D} = 20A, \ R_{GEN} = 6\Omega \qquad - 30 \qquad - ns \\ \textbf{t}_{f} \text{Turn-Off Fall Time} \qquad - 18 \qquad - ns \\ \textbf{Drain-Source Diode Characteristics and Max Ratings} \\ \textbf{I}_{S} \text{Maximum Continuous Drain to Source Diode Forward Current} \qquad - \qquad - 60 \qquad A \\ \textbf{I}_{SM} \text{Maximum Pulsed Drain to Source Diode Forward Current} \qquad - \qquad - 240 \qquad A \\ \textbf{V}_{SD} \text{Drain to Source Diode Forward Voltage} \textbf{V}_{GS} = 0V, \ \textbf{I}_{S} = 30A \qquad - \qquad - \qquad 1.2 \qquad V \\ \text{trr} \text{Body Diode Reverse Recovery Time} \qquad \textbf{I}_{F} = 20A, \ di/dt = 100A/us \qquad - 50 \qquad - ns \\ \textbf{I}_{F} = 20A, \ di/dt = 100A/us} \qquad - \qquad - 50 \qquad - ns \\ \textbf{I}_{F} = 20A, \ di/dt = 100A/us} \qquad - \qquad - 50 \qquad - \qquad - ns \\ \textbf{I}_{F} = 20A, \ di/dt = 100A/us} \qquad - \qquad - 50 \qquad - \qquad - ns \\ \textbf{I}_{F} = 20A, \ di/dt = 100A/us} \qquad - \qquad - \qquad - 50 \qquad - \qquad - \qquad - \qquad - 1.2 \qquad V \\ \textbf{I}_{F} = 20A, \ di/dt = 100A/us} \qquad - \qquad - \qquad - 50 \qquad - \qquad $	Dynamic	Characteristics					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C _{iss}	Input Capacitance		- /	1176	-	pF
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C_{oss}	Output Capacitance		-	558	-	pF
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C_{rss}	Reverse Transfer Capacitance	1 - 11VII 12	X-\	7.6	-	pF
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Q_g	Total Gate Charge	(-	28	-	nC
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Q_{gs}	Gate Source Charge	00	U .	4.9	-	nC
$t_{d(on)} \text{Turn-On DelayTime} \qquad \qquad - \qquad 13.5 \qquad - \qquad \text{ns} \\ t_r \text{Turn-On Rise Time} \qquad V_{GS} = 10 \text{V, } V_{DD} = 50 \text{V} \qquad - \qquad 17.0 \qquad - \qquad \text{ns} \\ t_{d(off)} \text{Turn-Off DelayTime} \qquad I_D = 20 \text{A, } R_{GEN} = 6 \Omega \qquad - \qquad 30 \qquad - \qquad \text{ns} \\ t_f \text{Turn-Off Fall Time} \qquad - \qquad 18 \qquad - \qquad \text{ns} \\ \textbf{Drain-Source Diode Characteristics and Max Ratings} \\ I_S \text{Maximum Continuous Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 60 \qquad \text{A} \\ I_{SM} \text{Maximum Pulsed Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 240 \qquad \text{A} \\ V_{SD} \text{Drain to Source Diode Forward Voltage} V_{GS} = 0 \text{V, } I_S = 30 \text{A} \qquad - \qquad - \qquad 1.2 \qquad \text{V} \\ \text{trr} \text{Body Diode Reverse Recovery Time} \qquad - \qquad 50 \qquad - \qquad \text{ns} \\ I_F = 20 \text{A, di/dt} = 100 \text{A/us} \\ \end{cases}$	Q_{gd}	Gate Drain("Miller") Charge	V _{DS} = 30V, I _D = 20A	-	7	-	nC
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Switchin	g Characteristics					
$t_{d(off)} \text{Turn-Off DelayTime} \qquad I_D = 20\text{A}, \ R_{GEN} = 6\Omega \qquad - \qquad 30 \qquad - \qquad \text{ns}$ $t_f \text{Turn-Off Fall Time} \qquad - \qquad 18 \qquad - \qquad \text{ns}$ $\textbf{Drain-Source Diode Characteristics and Max Ratings}$ $I_S \text{Maximum Continuous Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 60 \qquad \text{A}$ $I_{SM} \text{Maximum Pulsed Drain to Source Diode Forward Current} \qquad - \qquad - \qquad 240 \qquad \text{A}$ $V_{SD} \text{Drain to Source Diode Forward Voltage} V_{GS} = 0\text{V}, \ I_S = 30\text{A} \qquad - \qquad - \qquad 1.2 \qquad \text{V}$ $\text{trr} \text{Body Diode Reverse Recovery Time} \qquad - \qquad 50 \qquad - \qquad \text{ns}$ $I_F = 20\text{A}, \ \text{di/dt} = 100\text{A/us}$	t _{d(on)}	Turn-On DelayTime		-	13.5	-	ns
$t_{\rm f} \text{Turn-Off Fall Time} \qquad \qquad - \qquad 18 \qquad - \qquad \text{ns}$	t_r	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 50V$	-	17.0	-	ns
Drain-Source Diode Characteristics and Max Ratings I_S Maximum Continuous Drain to Source Diode Forward Current60A I_{SM} Maximum Pulsed Drain to Source Diode Forward Current240A V_{SD} Drain to Source Diode Forward Voltage $V_{GS} = 0V$, $I_S = 30A$ 1.2VtrrBody Diode Reverse Recovery Time-50-ns $I_F = 20A$, di/dt = 100A/us	$t_{\text{d(off)}}$	Turn-Off DelayTime	$I_D=20A$, $R_{GEN}=6\Omega$	-	30	-	ns
I_S Maximum Continuous Drain to Source Diode Forward Current60A I_{SM} Maximum Pulsed Drain to Source Diode Forward Current240A V_{SD} Drain to Source Diode Forward Voltage $V_{GS} = 0V$, $I_S = 30A$ 1.2VtrrBody Diode Reverse Recovery Time-50-ns	t_f	Turn-Off Fall Time		-	18	-	ns
I_{SM} Maximum Pulsed Drain to Source Diode Forward Current 240 A V_{SD} Drain to Source Diode Forward Voltage $V_{GS} = 0V$, $I_S = 30A$ 1.2 V trr Body Diode Reverse Recovery Time $I_F = 20A$, di/dt = 100A/us	Drain-So	urce Diode Characteristics and M	Max Ratings				
V_{SD} Drain to Source Diode Forward Voltage $V_{GS} = 0V$, $I_S = 30A$ 1.2 V trr Body Diode Reverse Recovery Time $I_F = 20A$, di/dt = 100A/us	Is	Maximum Continuous Drain to Source D	iode Forward Current	-	-	60	Α
trr Body Diode Reverse Recovery Time - 50 - ns $I_F = 20A$, di/dt = 100A/us	I _{SM}	Maximum Pulsed Drain to Source Diode	Forward Current	-	-	240	Α
$I_F = 20A$, di/dt = 100A/us	V_{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 30A	-	-	1.2	V
	trr	Body Diode Reverse Recovery Time	1 = 2004 41/44 = 4004/	-	50	-	ns
	Qrr	Body Diode Reverse Recovery Charge	ı _F = 20A, ai/at = 100A/us	-	80	-	nC
	Qrr	Body Diode Reverse Recovery Charge		-	80	-	n(

Notes:

^{1.} Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

^{2.} E_{AS} condition: Starting T_J =25°C, V_{DD} =50V, V_G =10V, R_G =25ohm, L=0.5mH, I_{AS} =19A

^{3.} Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.



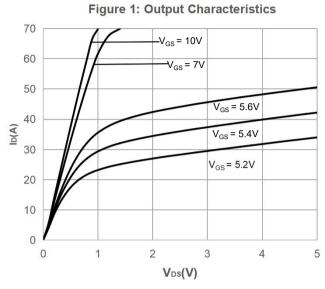
N-Channel 100V, 9.5mΩ Typ. Power MOSFET

Typical Performance Characteristics

30

25

V_{DS} = 5V



20

Figure 2: Typical Transfer Characteristics

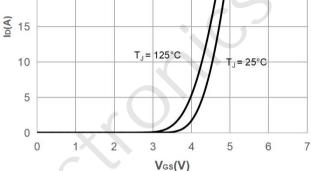


Figure 3: On-resistance vs. Drain Current

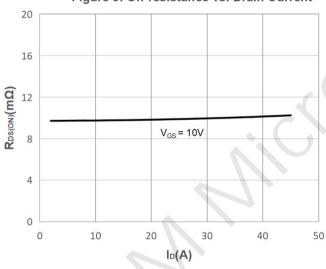


Figure 4: Body Diode Characteristics

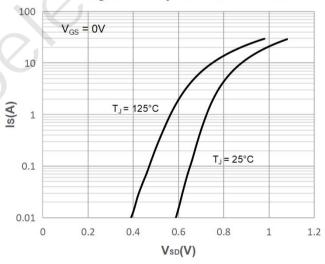


Figure 5: Gate Charge Characteristics

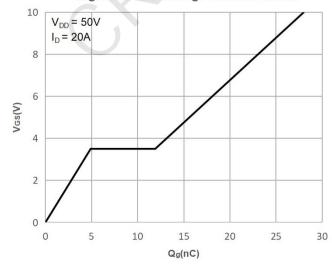
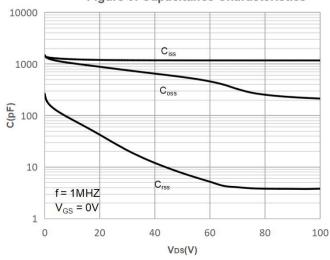


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs.
Junction Temperature

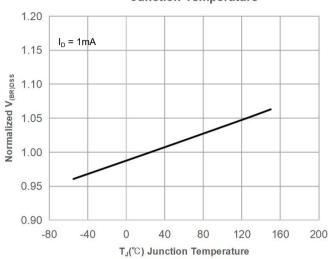


Figure 9: Maximum Safe Operating Area

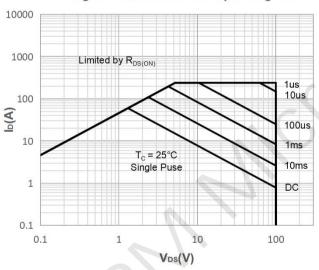


Figure 11: Normalized Maximum Transient

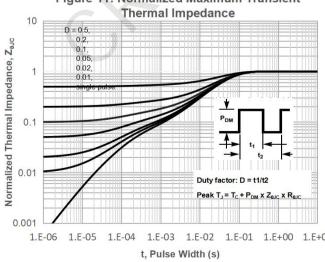


Figure 8: Normalized on Resistance vs. Junction Temperature

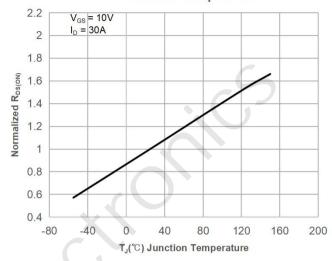


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

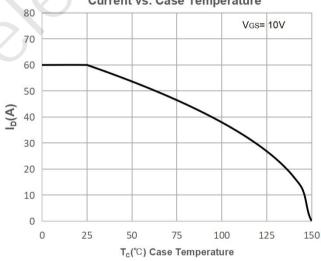
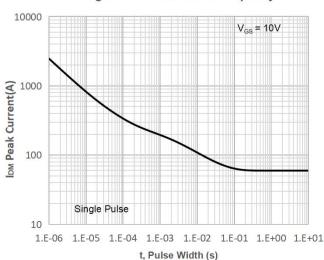


Figure 12: Peak Current Capacity



N-Channel 100V, 9.5mΩ Typ. Power MOSFET

Test Circuit

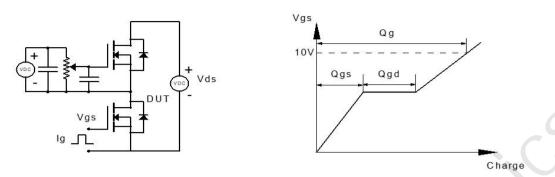


Figure 1: Gate Charge Test Circuit & Waveform

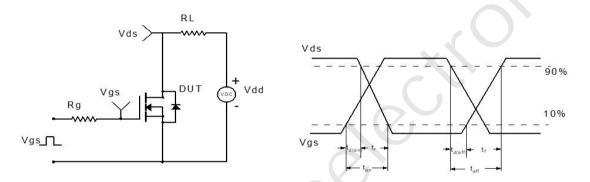


Figure 2: Resistive Switching Test Circuit & Waveform

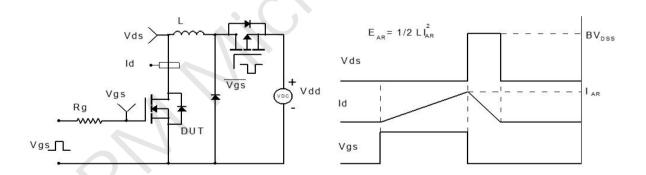


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

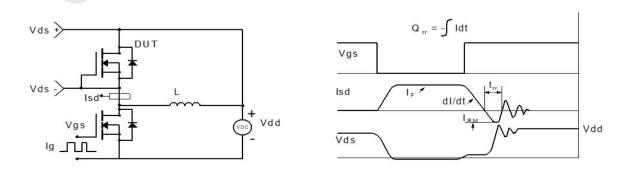
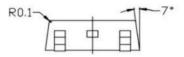
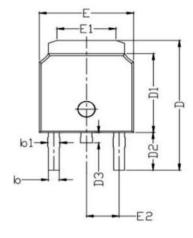


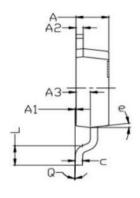
Figure 4: Diode Recovery Test Circuit & Waveform

N-Channel 100V, 9.5mΩ Typ. Power MOSFET

Package Mechanical Data(TO-252-3L)







COMMON DIMENSION(MM)					
PKG	TO-252-3L				
Symbot	MIN	MAX			
Α	2.250	2.300	2.400		
A1	0.010	0.060	0.150		
A2	0.500	0.508	0.550		
A3	0.960	1.010	1.060		
b	0.740	0.760	0.800		
b1	0.880	0.900	0.950		
С	0.500	0.508	0.550		
D	9.800	10.025	10.350		
D1	6.050	6.100	6.180		
D2	2.850	2.900	2.950		
D3	0.700	0.800	2.900		
Е	6.550	6.600	6.700		
E1	4.050	4.130	4.200		
E2	2.250	2.286	2.300		
L	1.400 1.500		1.600		
e	7.000				
Q	0°	2°	5°		

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