

Description

Features

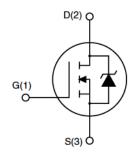
- 100V, 57A
- $R_{DS(ON)} = 21m\Omega$ (Typ.) @ $V_{GS} = 10V$, $I_{D} = 28.5A$
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

Application

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)







Schematic Diagram

Absolute Maximum Ratings (Tc=25℃ unless otherwise specified)

Symbol	Parameter		Max . TO-220C/TO-263	Units
V _{DSS}	Drain-Source Voltage		100	V
Vgss	Gate-Source Voltage		±20	V
ΙD	Continuous Drain Current	T _C = 25 °C	57	А
		T _C = 100℃	35	А
I _{DM}	Pulsed Drain Current note1		228	А
Eas	Single Pulsed Avalanche Energy note2		605	mJ
P _D	Power Dissipation	T _C = 25 °C	169	W
Rejc	Thermal Resistance, Junction to Case		0.74	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient		62.5	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	$^{\circ}$ C



Electrical Characteristics (T_C =25 $^{\circ}$ C unless otherwise specified)

I _{DSS}	Symbol	Parameter	Test Condition	Min.	Тур.	Max.	Units			
I _{DSS}	Off Characteristic									
Ioss Zero Gate Voltage Drain Current T.J= 25°C - - 1 μ	V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V,I _D =250µA	100	-	-	V			
On Characteristics V _{GS(th)} Gate Threshold Voltage V _{DS} = V _{GS} , I _D = 250μA 2 3 4 N RDS(on) Static Drain-Source on-Resistance notes V _{GS} = 10V, I _D = 28.5A - 21 25 m Dynamic Characteristics Ciss Input Capacitance V _{DS} = 25V, V _{GS} = 0V, F = 1.0MHz - 3140 - p Coss Output Capacitance V _{DS} = 25V, V _{GS} = 0V, F = 1.0MHz - 360 - p Crss Reverse Transfer Capacitance V _{DD} = 80V, I _D = 57A, V _{GS} = 10V - 126 - n Qg Total Gate Charge V _{DD} = 80V, I _D = 57A, V _{GS} = 10V - 10 - n Qgs Gate-Drain("Miller") Charge V _{DD} = 80V, I _D = 57A, V _{GS} = 10V - 36 - n Switching Characteristics td(on) Turn-on Delay Time V _{DD} = 50V, I _D = 57A, V _{DD} = 57A, C _D - 60 - n tf Turn-off Delay Time R _G = 25Ω - 101 -	I _{DSS}	Zero Gate Voltage Drain Current	, , ,	-	-	1	μA			
V _{GS(th)} Gate Threshold Voltage V _{DS} = V _{GS} , I _D = 250μA 2 3 4 V _{DS} Static Drain-Source on-Resistance note3 V _{GS} = 10V, I _D = 28.5A - 21 25 m	Igss	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA			
Static Drain-Source on-Resistance V _{GS} = 10V, I _D = 28.5A - 21 25 m	On Characteristics									
Note	$V_{GS(th)}$	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250µA	2	3	4	V			
Ciss Input Capacitance V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz - 3140 - p - 360 - p Crss Reverse Transfer Capacitance - 140 - p - 140 - p - 140 - p Qg Total Gate Charge V _{DD} = 80V, I _D = 57A, V _{GS} = 10V - 126 - n - 10 - n Qgs Gate-Source Charge V _{DD} = 80V, I _D = 57A, V _{GS} = 10V - 36 - n - n Switching Characteristics td(on) Turn-on Delay Time - 35 - n - n tr Turn-on Rise Time V _{DD} = 50V, I _D = 57A, - 60 - n - 60 - n tf Turn-off Delay Time R _G = 25Ω - 101 - n tf Turn-off Fall Time - 95 - n Drain-Source Diode Characteristics and Maximum Ratings Is Maximum Continuous Drain to Source Diode Forward - 57 7 I _{SM} Maximum Pulsed Drain to Source Diode Forward - 228 7 V _{SD} Drain to Source Diode Forward - 228 7	R _{DS(on)}		V _{GS} =10V, I _D =28.5A	-	21	25	mΩ			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Dynamic Characteristics									
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ciss	Input Capacitance		-	3140	-	pF			
Crss Reverse Transfer Capacitance - 140 - p	Coss	Output Capacitance		-	360	-	pF			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Crss	Reverse Transfer Capacitance		-	140	-	pF			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Qg	Total Gate Charge	· · · · · · · · · · · · · · · · · · ·	-	126	-	nC			
Qgd Gate-Drain("Miller") Charge - 36 - n	Qgs	Gate-Source Charge		-	10	-	nC			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Q_{gd}	Gate-Drain("Miller") Charge	VGS - 10V	-	36	-	nC			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Switching Characteristics									
t _{d(off)} Turn-off Delay Time	t _{d(on)}	Turn-on Delay Time	· · · · · · · · · · · · · · · · · · ·	-	35	-	ns			
tr Turn-off Fall Time - 95 - no prain-Source Diode Characteristics and Maximum Ratings Is Maximum Continuous Drain to Source Diode Forward Current - 57 Ism Maximum Pulsed Drain to Source Diode Forward Current - 228 Very Drain to Source Diode Forward Very = 0V Isp = 57A - 14	t _r	Turn-on Rise Time		-	60	-	ns			
Drain-Source Diode Characteristics and Maximum Ratings Is Maximum Continuous Drain to Source Diode Forward Current IsM Maximum Pulsed Drain to Source Diode Forward Current Vsp Drain to Source Diode Forward Vss = 0V lss = 57A 1 4 1	t _{d(off)}	Turn-off Delay Time		-	101	-	ns			
Is Maximum Continuous Drain to Source Diode Forward Current Ism Maximum Pulsed Drain to Source Diode Forward Current Vsp Drain to Source Diode Forward Vsp = 0V lsp = 57A	t _f	Turn-off Fall Time		-	95	-	ns			
S Current - 57 A Ism Maximum Pulsed Drain to Source Diode Forward Current - 228 A Ven Drain to Source Diode Forward Ves = 0V lsp = 57A - 14	Drain-Source Diode Characteristics and Maximum Ratings									
V _{SD} Drain to Source Diode Forward V _{SD} = 0V _{ISD} = 57A 1.4	ls			-	-	57	А			
$ V_{cs} = 0V_{lsp} = 57A_{lsp} - - - 14_{lsp} V_{cs} = 0V_{lsp} = 57A_{lsp} - - - 14_{lsp} V_{csp} = 57A_{lsp} - - - 14_{lsp} V_{csp} = 57A_{lsp} - - - - 14_{lsp} V_{csp} = 57A_{lsp} - - - - 14_{lsp} V_{csp} = 57A_{lsp} - - - - - 14_{lsp} V_{csp} = 57A_{lsp} - - - - - - - - - $	Ism	Maximum Pulsed Drain to Source Diode Forward Current			-	228	Α			
Voltage January Janu	V_{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =57A	-	-	1.4	V			
t _{rr} Reverse Recovery Time V _{GS} =0V, I _S =57A, - 250 - n	t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =57A,	-	250	-	ns			
Q _{rr} Reverse Recovery Charge di/dt=100A/μs - 2 - μ	Qrr	Reverse Recovery Charge	di/dt=100A/µs	-	2	-	μC			

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

- 2. V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C
- 3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤1%



Typical Performance Characteristics

Figure1: Output Characteristics

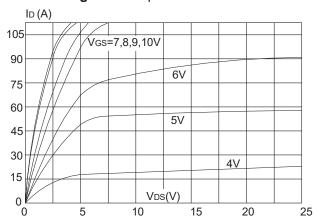


Figure 3:On-resistance vs. Drain Current

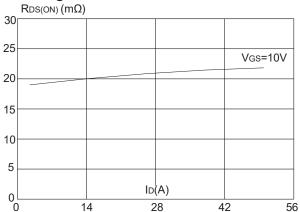


Figure 5: Gate Charge Characteristics

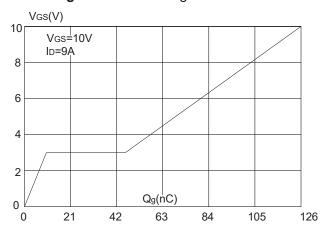


Figure 2: Typical Transfer Characteristics

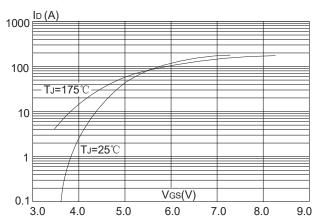


Figure 4: Body Diode Characteristics

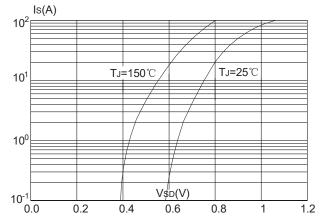


Figure 6: Capacitance Characteristics

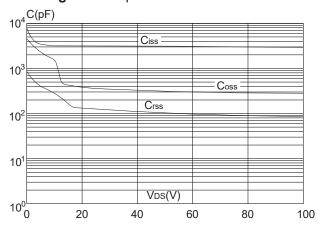




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

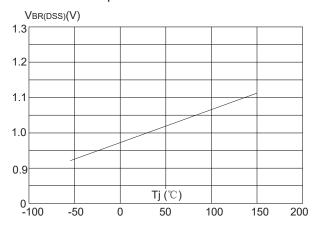


Figure 9: Maximum Safe Operating Area

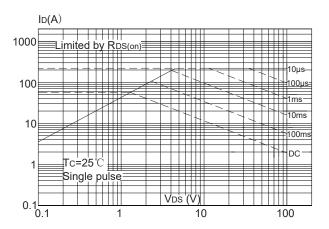


Figure.11: Maximum Effective
Transient Thermal Impedance, Junction-to-Case
(TO-220C,TO-263)

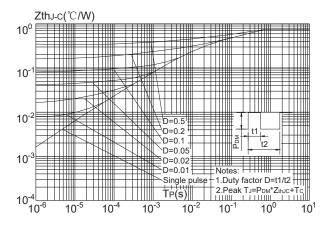


Figure 8: Normalized on Resistance vs. Junction Temperature

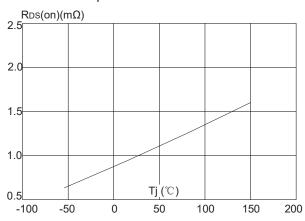
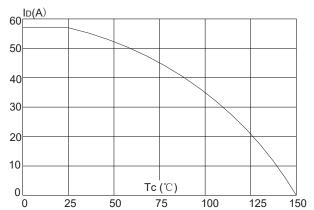


Figure 10: Maximum Continuous Drain Current vs. Case Temperature





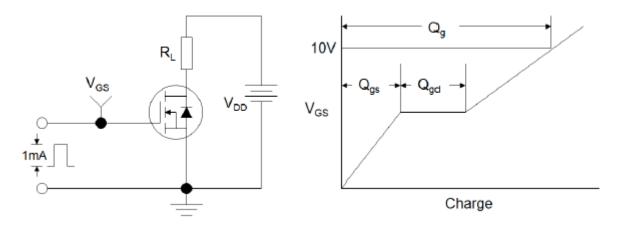


Figure1:Gate Charge Test Circuit & Waveform

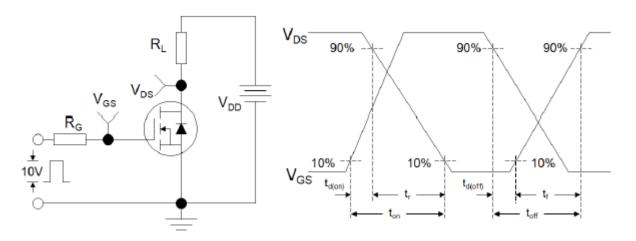


Figure 2: Resistive Switching Test Circuit & Waveforms

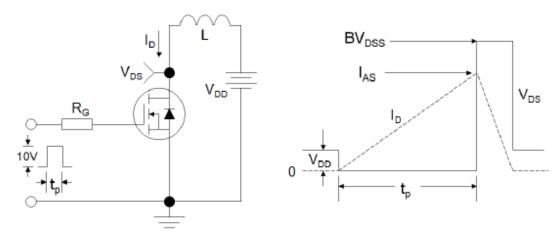
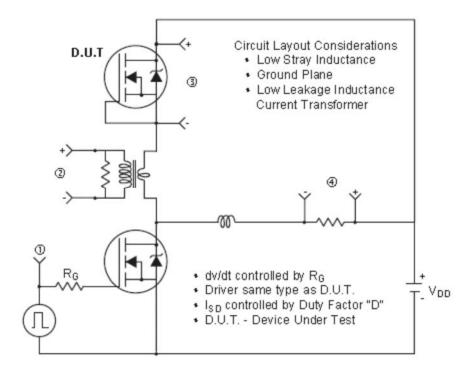
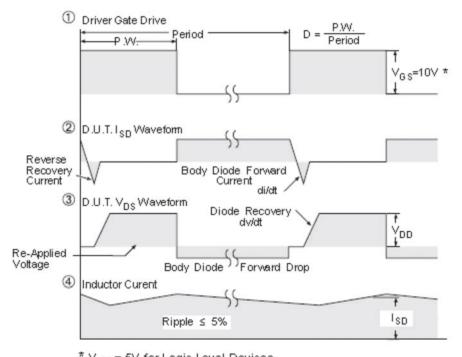


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms







* V_{GS} = 5V for Logic Level Devices

Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)