



800V 290mΩ NCH Super Junction MOSFET

General Description

This Power MOSFET is produced using Msemitek's advanced Superjunction MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies.

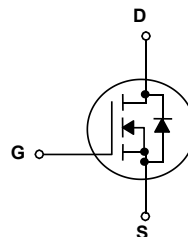
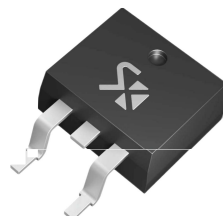
Features

- 850V@ $T_J=150^{\circ}\text{C}$
- 25A, 800V, $R_{DS(on)}=290\text{m}\Omega@V_{GS}=10\text{V}$
- Low gate charge (typ. $Q_g=17.7\text{nC}$)
- High ruggedness
- Ultra fast switching
- 100% avalanche tested
- Improved dv/dt capability

Applications

- SMPS
- Motor Drivers
- Charger/Power Supply
- UPS

TO-263



Absolute Maximum Ratings

$T_C = 25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Voltage	$V_{GD} = 0\text{V}$, $I_D = 250\mu\text{A}$	800			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\mu\text{A}$	3.4	4	4.6	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 808\text{V}$, $V_{GS} = 0\text{V}$			1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS}=30\text{V}$, $V_{DS}=0\text{V}$			500	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-500	
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=12.5\text{A}$			290	mΩ
T_J	Operating and Storage Temperature Range	-40 to +150 °C				

* Drain current limited by maximum junction temperature.



Package Marking

Part Number	Top Marking	Package	Packing Method	MOQ	QTY
		TO-263	Tube		

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	800	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	500	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-500	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	3.4	4	4.6	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 12.5\text{ A}$	--	--	290	m Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	--	2224	--	pF
C_{oss}	Output Capacitance		--	90	--	pF
C_{rss}	Reverse Transfer Capacitance		--	2.8	--	pF

Switching Characteristics

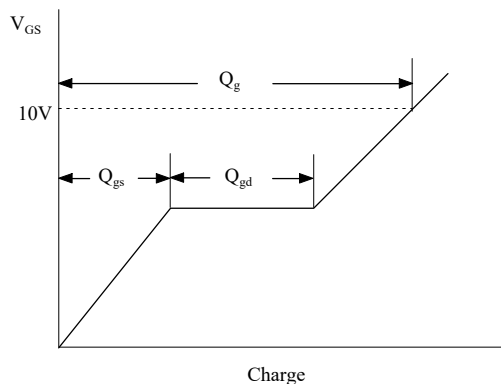
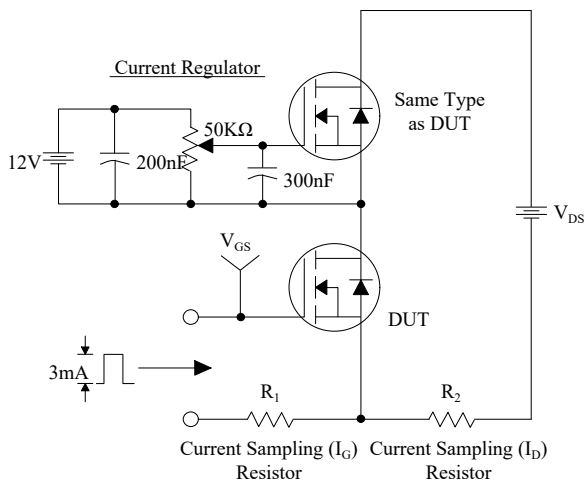
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 300\text{ V}, I_D = 10\text{ A}, R_G = 25\Omega, V_{GS} = 10\text{ V}$	--	45	--	ns
t_r	Turn-On Rise Time		--	62	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	160	--	ns
t_f	Turn-Off Fall Time		--	34	--	ns
Q_g	Total Gate Charge	$V_{DS} = 480\text{ V}, I_D = 10\text{ A}, V_{GS} = 10\text{ V}$	--	45	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	nC
Q_{gd}	Gate-Drain Charge		--	21	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

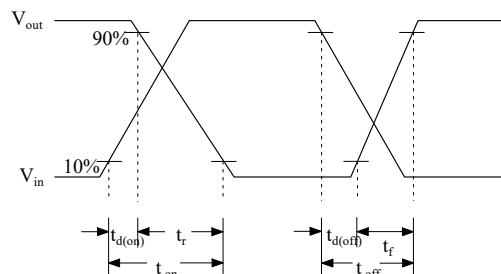
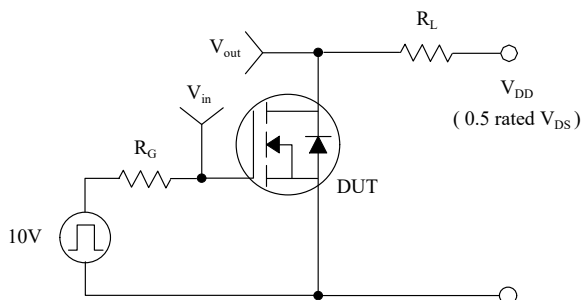
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	21	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	78	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 8A	--	--	1.2	V
t _{rr}	Reverse Recovery Time	V _{DS} =50 V, I _S = 10A, dI _F / dt = 100A/us	--	270	--	ns
Q _{rr}	Reverse Recovery Charge		--	3.9	--	uC



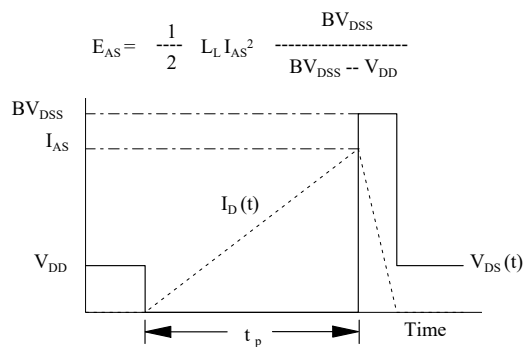
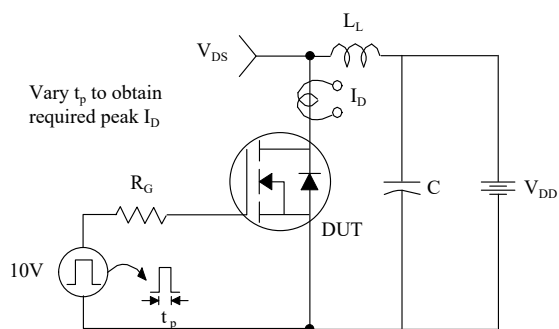
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

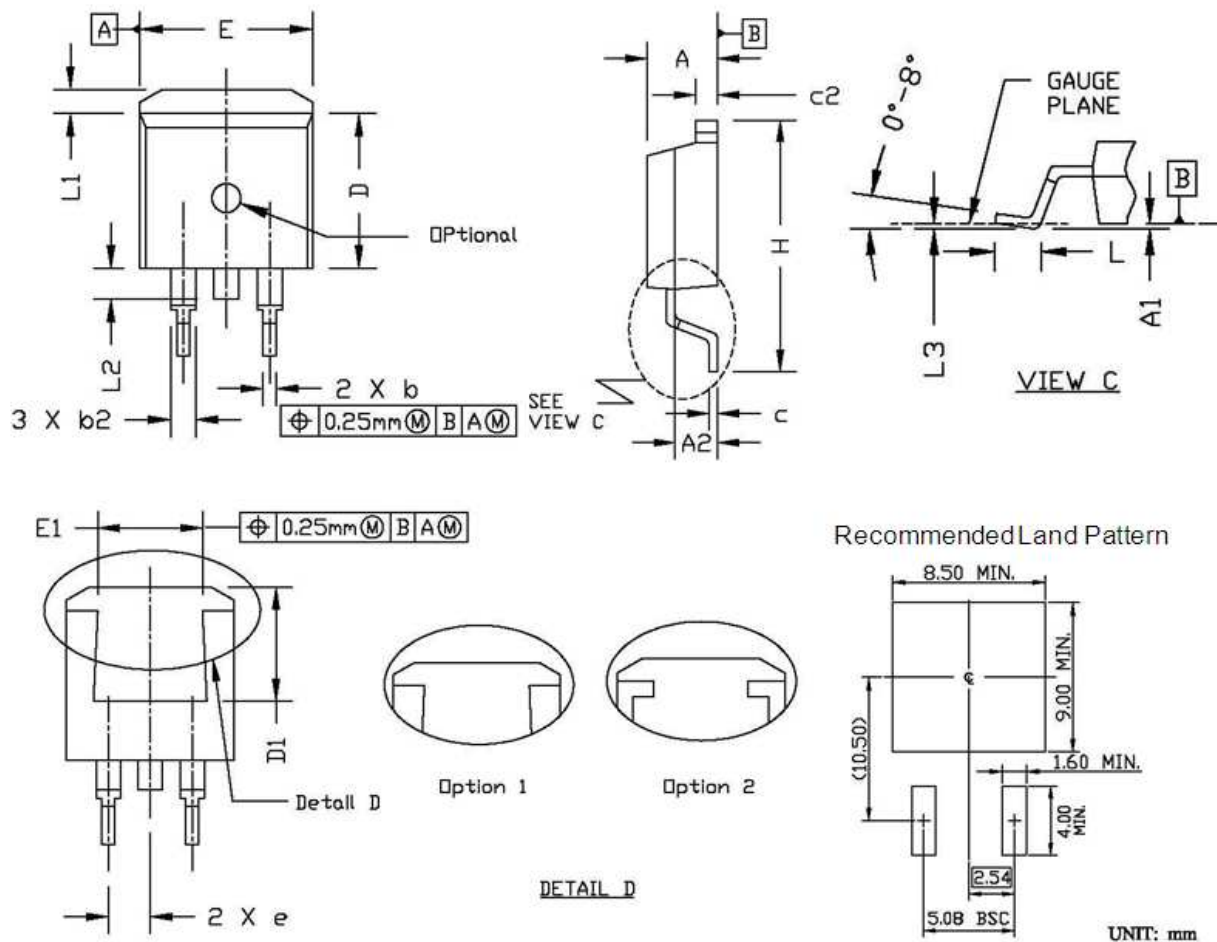


Unclamped Inductive Switching Test Circuit & Waveforms





TO-263 OUTLINE





TO-263 OUTLINE

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.86	0.169	0.191
A1	0.00	0.25	0.000	0.010
A2	2.34	2.79	0.092	0.110
b	0.68	0.94	0.027	0.037
b2	1.15	1.35	0.045	0.053
c	0.33	0.65	0.013	0.026
c2	1.17	1.40	0.046	0.055
D	8.38	9.45	0.330	0.372
D1	6.90	8.17	0.272	0.322
e	2.54 BSC.		0.100 BSC.	
E	9.78	10.50	0.385	0.413
E1	6.50	8.60	0.256	0.339
H	14.61	15.88	0.575	0.625
L	2.24	3.00	0.088	0.118
L1	0.70	1.60	0.028	0.063
L2	1.00	1.78	0.039	0.070
L3	0.00	0.25	0.000	0.010