

Main Product Characteristics:

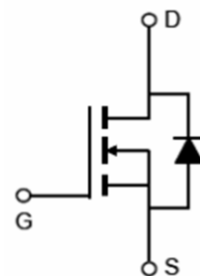
V_{DSS}	85V
$R_{DS(on)}$	4.2m Ω (typ.)
I_D	120A



TO-263



Marking and Pin Assignments



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ^①	120	A
I_{DM}	Pulsed Drain Current ^②	480	
P_D @TC = 25°C	Power Dissipation ^③	220	W
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	560	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

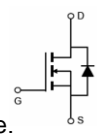
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ^③	—	0.7	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	—	58	$^{\circ}C/W$

Electrical Characteristics @ $T_A=25^{\circ}C$ unless otherwise specified

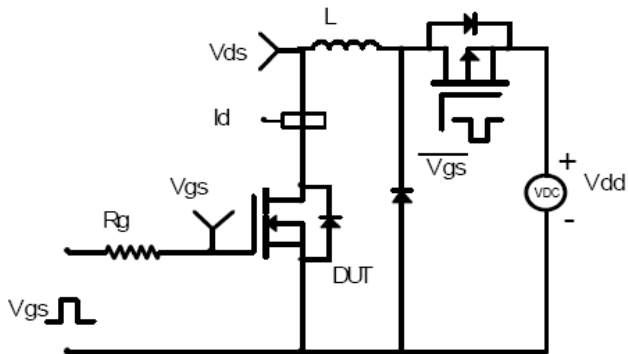
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	85	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4.2	5.2	m Ω	$V_{GS} = 10V, I_D = 20A$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 80V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{DS} = 0V, V_{GS} = \pm 20V$
		—	—	-100		$V_{DS} = 0V, V_{GS} = \pm 20V$
g_{fs}	Forward Transconductance ²	—	55	—	S	$V_{DS} = 5V, I_D = 20A$
Q_g	Total gate charge	—	61	—	nC	$I_D = 50A,$ $V_{DS} = 40V,$ $V_{GS} = 10V$
Q_{GS}	Gate-to-Source charge	—	21	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	11	—		
$t_{d(on)}$	Turn-on delay time	—	16	—	ns	$V_{GS} = 10V$ $V_{DS} = 40V,$ $R_{GEN} = 3\Omega$ $I_D = 50A$
t_r	Rise time	—	51	—		
$t_{d(off)}$	Turn-Off delay time	—	37	—		
t_f	Fall time	—	8	—		
C_{iss}	Input capacitance	—	4645	—	pF	$V_{GS} = 0V$ $V_{DS} = 40V$ $f = 1MHz$
C_{oss}	Output capacitance	—	673	—		
C_{rss}	Reverse transfer capacitance	—	41	—		

Source-Drain Ratings and Characteristics

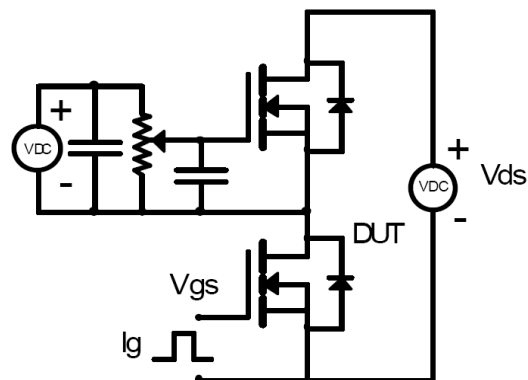
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	120	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S = 10A, V_{GS} = 0V$
t_{rr}	Reverse Recovery Time	—	69	—	ns	$I_S = 20A, di/dt = 100A/us$
Q_{rr}	Reverse Recovery Charge	—	141	—	nC	

Test Circuits and Waveforms

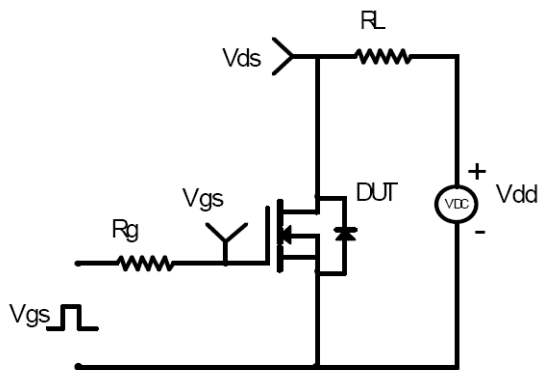
EAS Test Circuit:



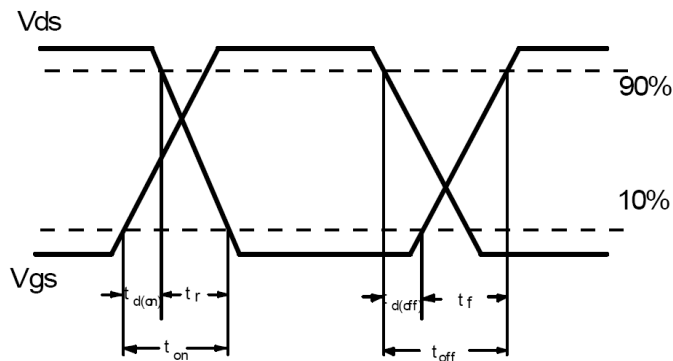
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

Typical Electrical and Thermal Characteristics

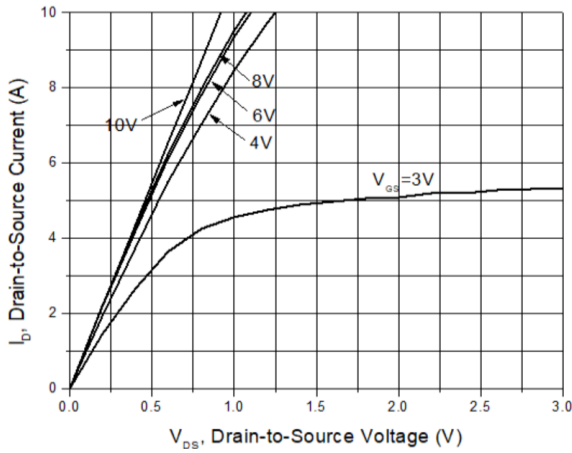


Figure1. Output Characteristics

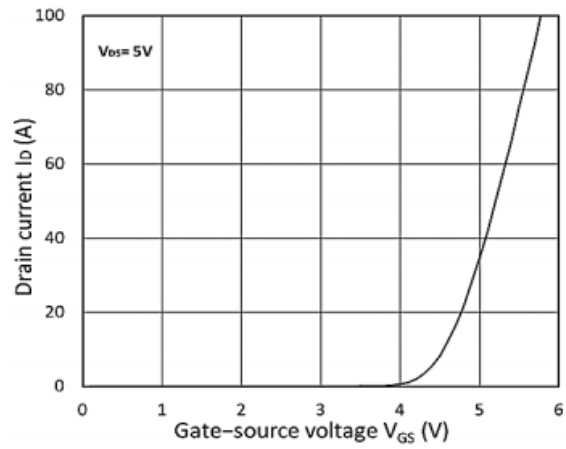


Figure2. Transfer Characteristics

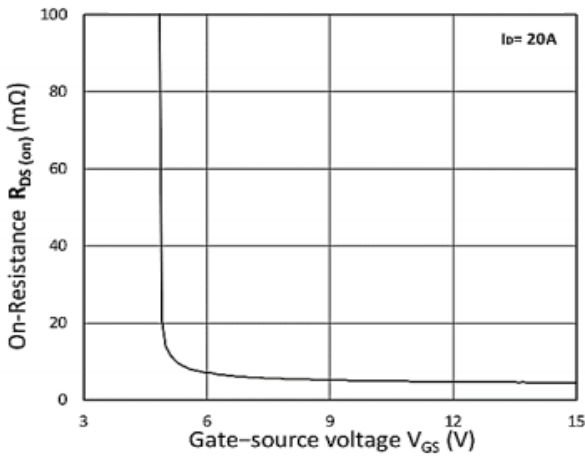


Figure3. RDS(ON) vs.VGS

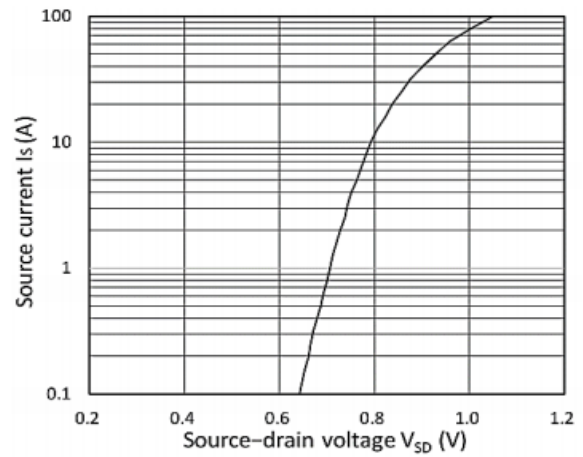


Figure4. Forward Characteristics of Reverse

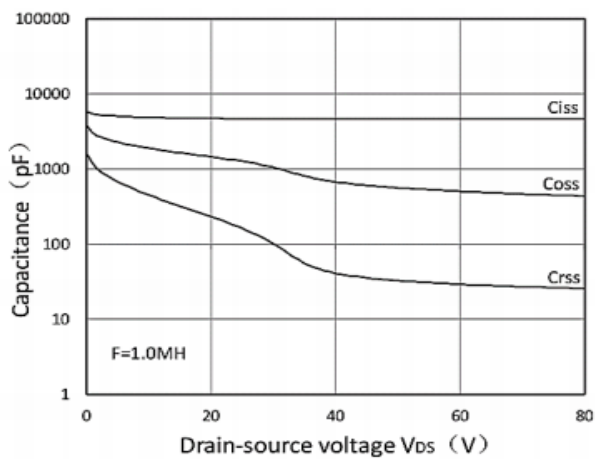


Figure5. Capacitance Characteristics

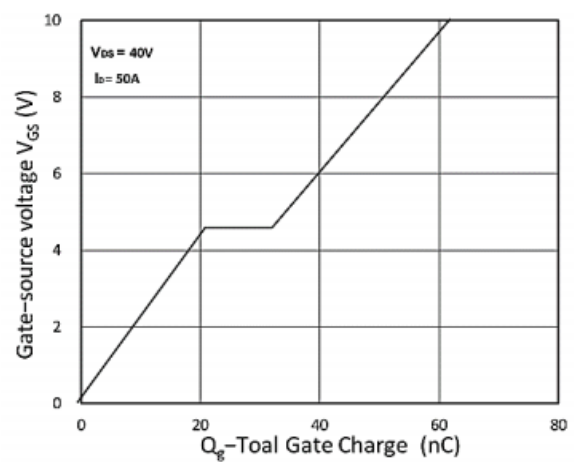


Figure6. Gate Charge Characteristics

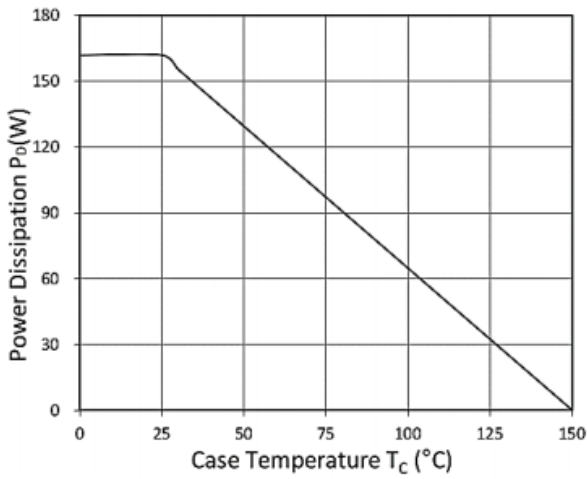


Figure7. Power Dissipation

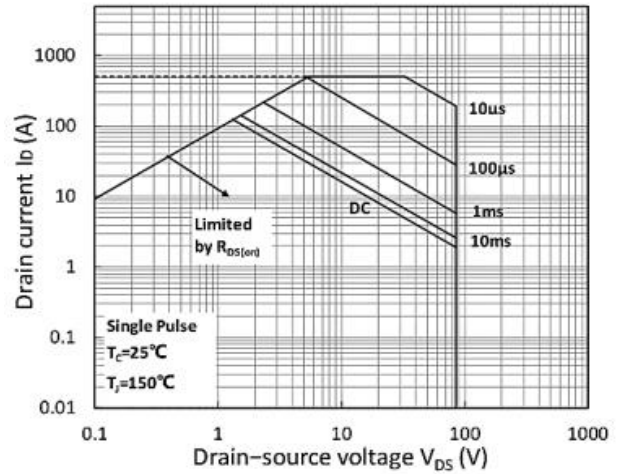


Figure8. Safe Operating Area

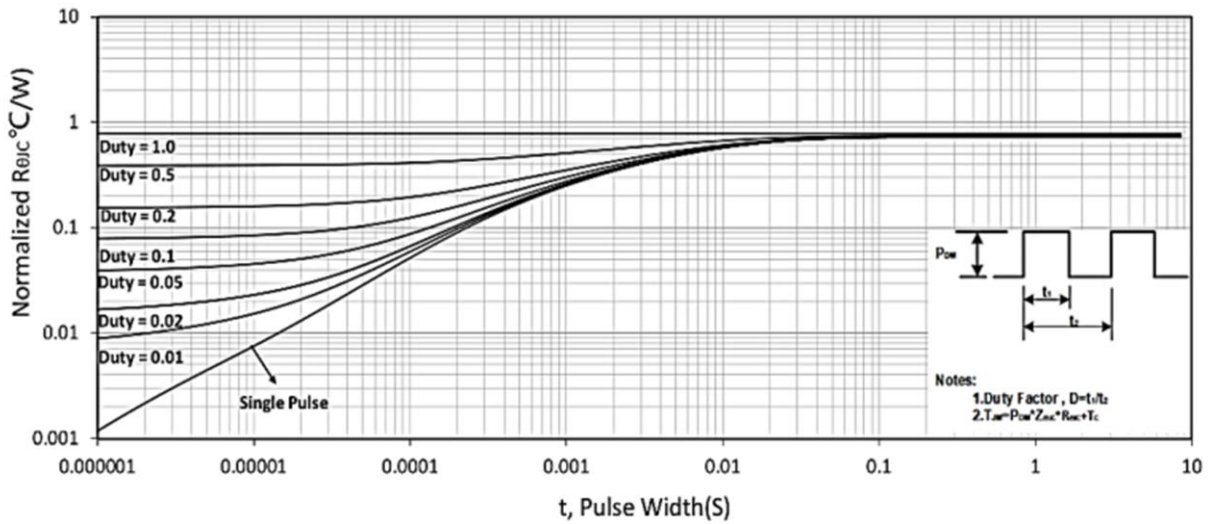
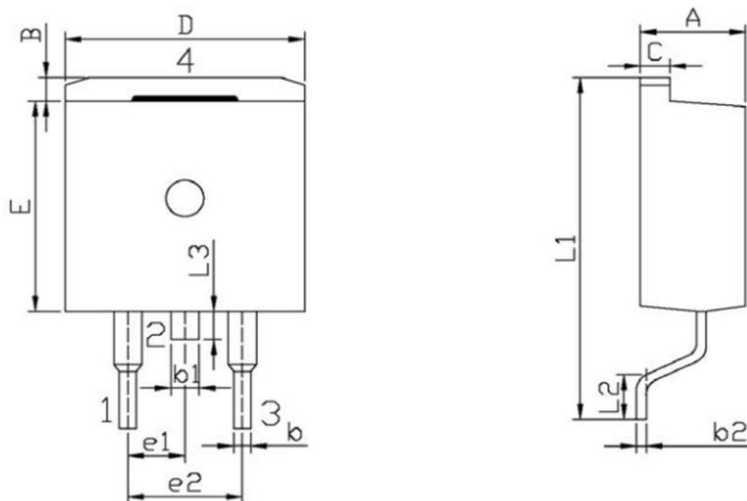


Figure9. Normalized Maximum Transient Thermal Impedance

Mechanical Data:

TO-263 Package Outline (Unit:mm)



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

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