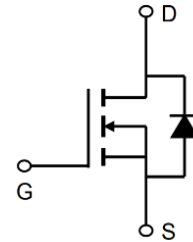




Description

These N-Channel enhancement mode power field effect transistors are using shielded gate trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.



General Features

$V_{DS} = 150V$ $I_D = 70A$

$R_{DS(ON)} < 28m\Omega @ V_{GS}=10V$ (Type: 22m Ω)

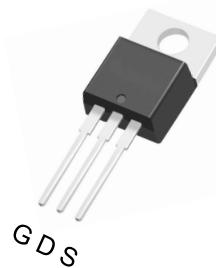
Application

Automotive lighting

Load switch

Uninterruptible power supply

TO-220



TO-263



Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	150	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 10V	70	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	50	A
IDM	Pulsed Drain Current ¹	210	A
EAS	Single pulsed avalanche energy	210	mJ
P _D @T _C =25°C	Total Power Dissipation	60	W
TSTG	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R θ JA	Maximum Thermal Resistance, Junctionambient	62.5	°C/W
R θ JC	Maximum Thermal Resistance, Junction-case	1.25	°C/W



Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	VGS=0 V, ID=250 μA	150	167		V
VGS(th)	Gate threshold voltage	VDS=VGS, ID=250 μA	2.0	3.0	4.0	V
RDS(ON)	Drain-source on-state resistance	VGS=10 V, ID=30 A		22	28	mΩ
IGSS	Gate-source leakage current	VGS=20 V			100	nA
		VGS=-20 V			-100	
IDSS	Drain-source leakage current	VDS=150 V, VGS=0 V			1	μA
RG	Gate resistance	f=1 MHz, Open drain		4		Ω
Ciss	Input capacitance	VGS=0V, VDS=75V, f=1MHz		1040		pF
Coss	Output capacitance			138		pF
Crss	Reverse transfer capacitance			8.2		pF
td(on)	Turn-on delay time	VGS=10V, VDS=75 V, RG=2 Ω, ID=30 A		21.4		ns
tr	Rise time			35.4		ns
td(off)	Turn-off delay time			40		ns
tf	Fall time			12.2		ns
Qg	Total gate charge	VGS=10V, VDS=75V, ID=30 A		15.2		nC
Qgs	Gate-source charge			5.4		nC
Qgd	Gate-drain charge			5.8		nC
trr	Reverse recovery time	VR=50 V, IS=65A, di/dt=100 A/μs		68		ns
Qrr	Reverse recovery charge			95		nC
Irrm	Peak reverse recovery current			210		A
VSD	Diode forward voltage	IS=30A, VGS=0 V			1.3	V

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V,L=0.1mH,IAS=40A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.



Typical Characteristics

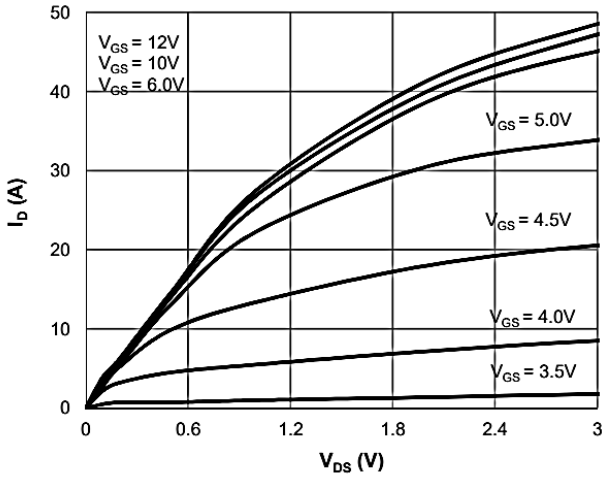


Figure 1: Saturation Characteristics

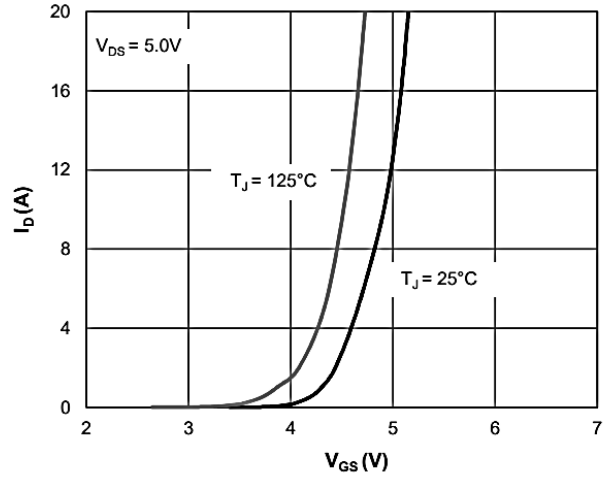


Figure 2: Transfer Characteristics

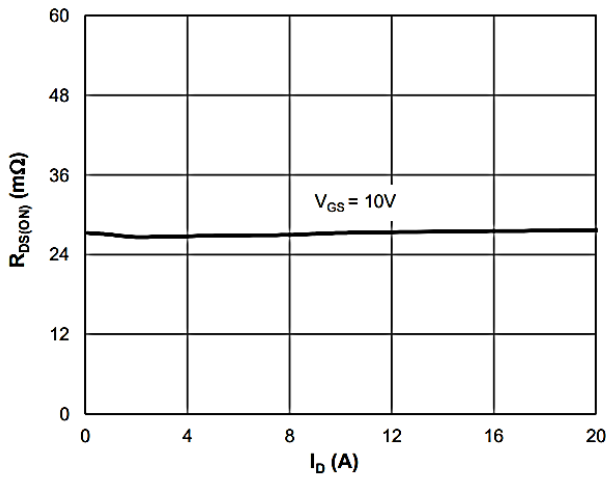


Figure 3: $R_{DS(ON)}$ vs. Drain Current

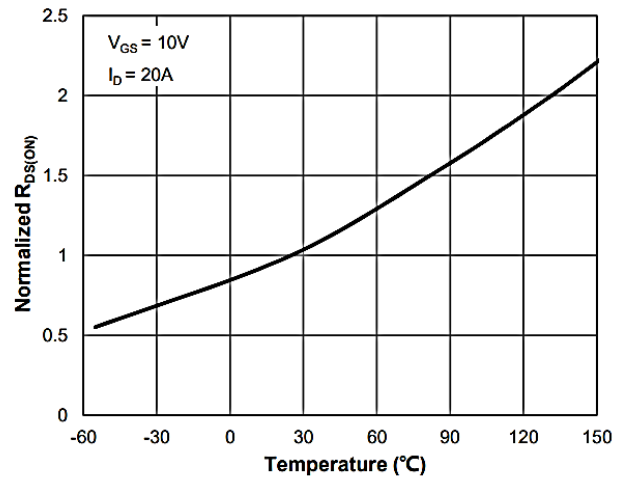


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

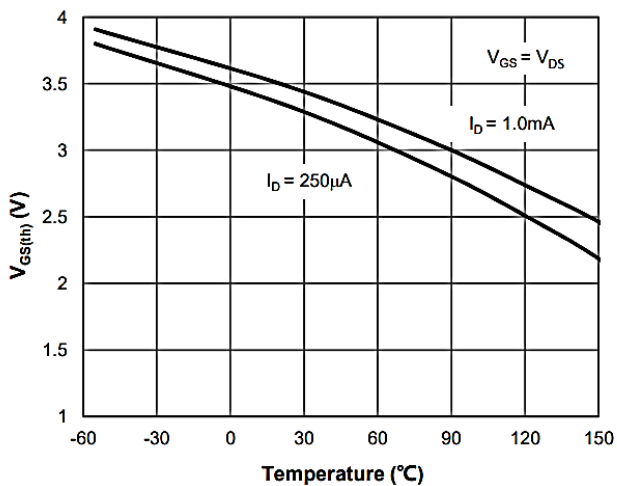


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

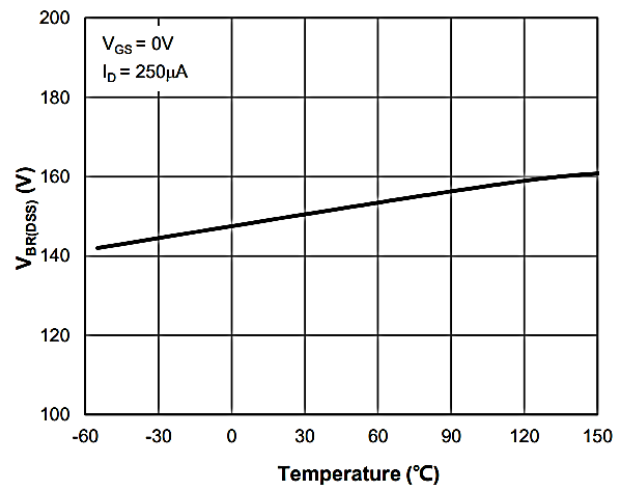


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

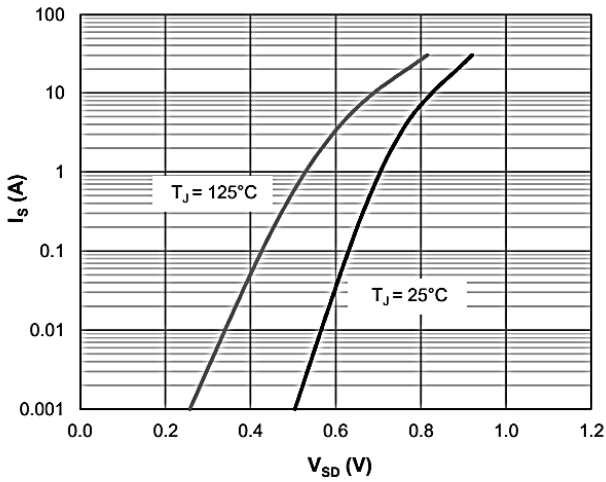


Figure 7: Body-Diode Characteristics

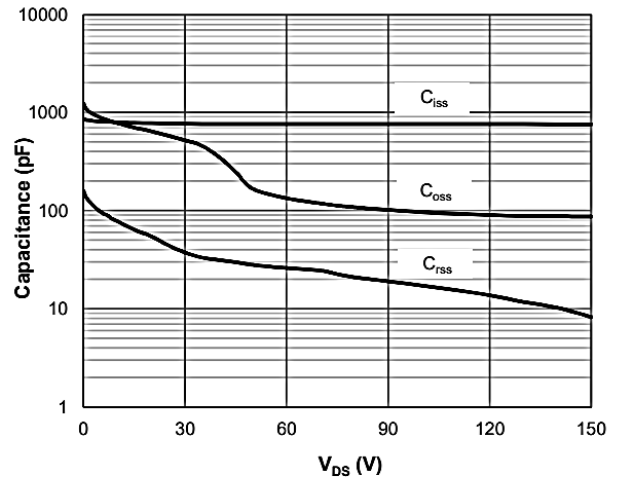


Figure 8: Capacitance Characteristics

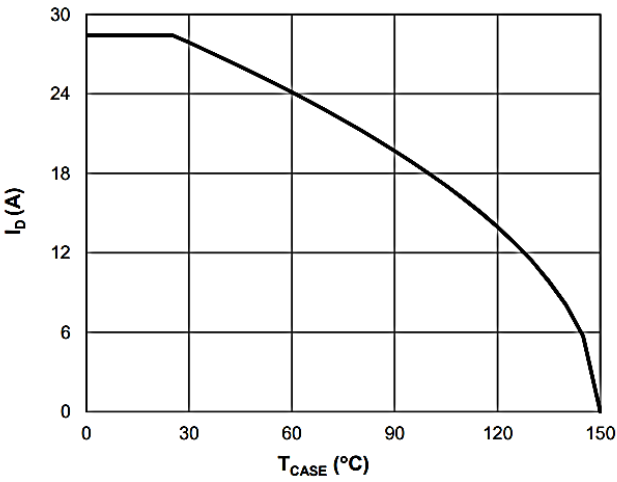


Figure 9: Current De-rating

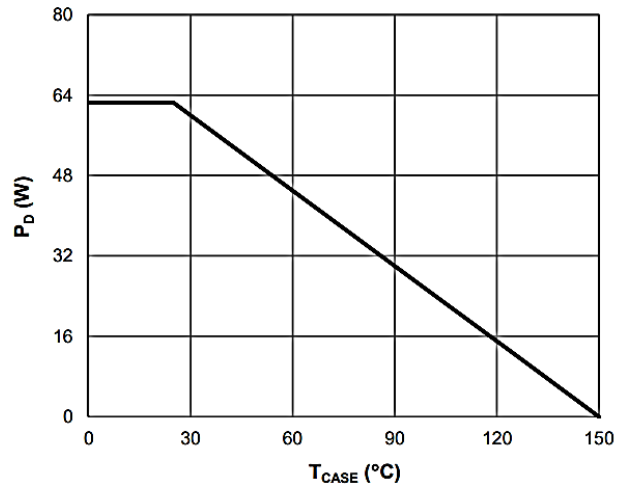


Figure 10: Power De-rating

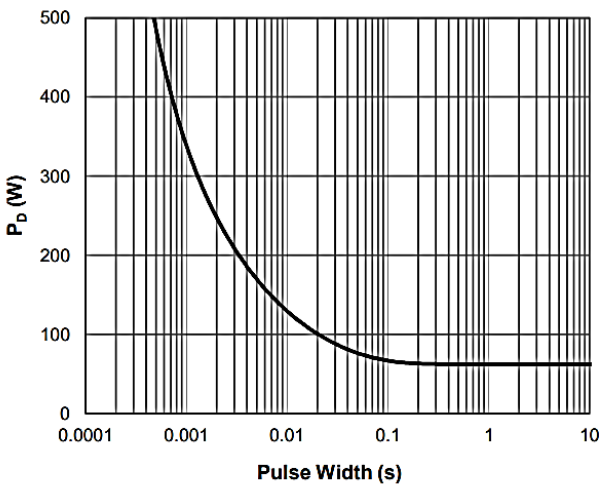


Figure 11: Single Pulse Power Rating, Junction-to-Case

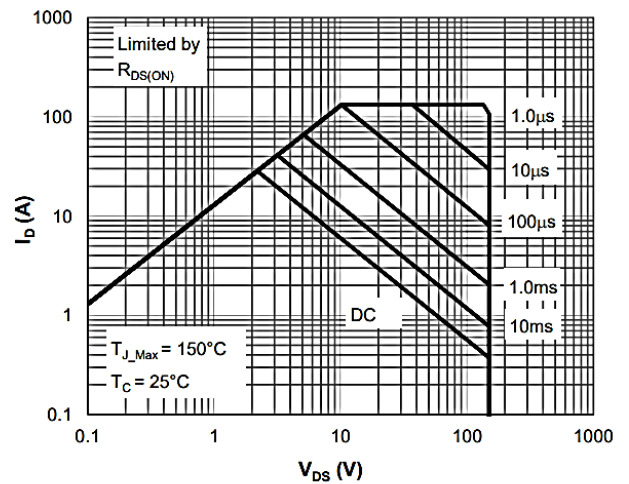
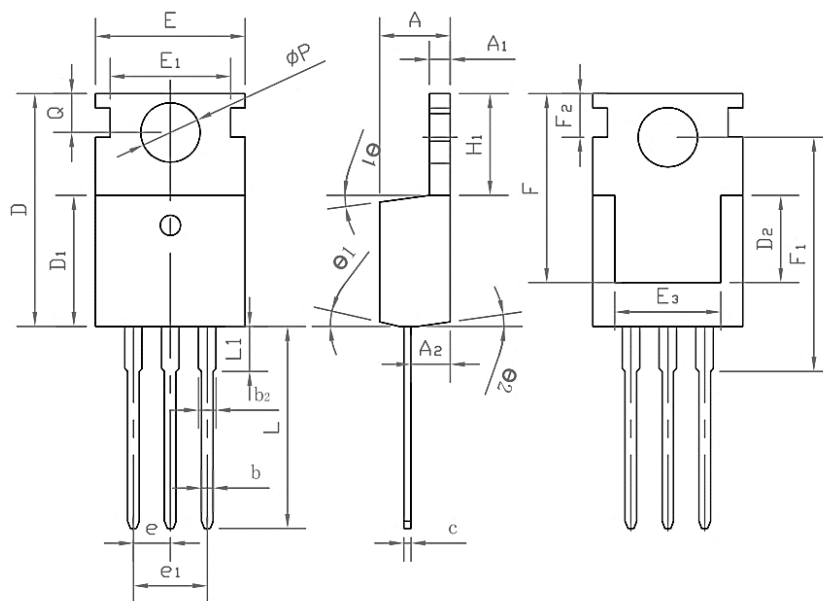


Figure 12: Maximum Safe Operating Area



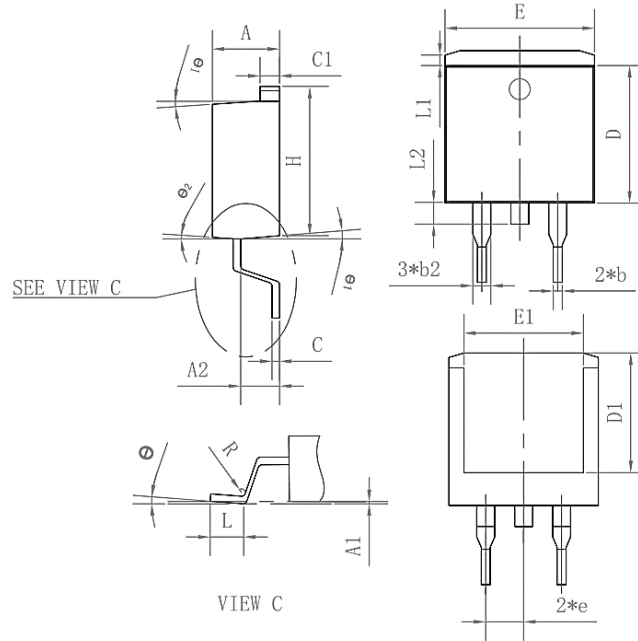
Package Mechanical Data-TO-220-3L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
D	0.40	0.50	0.65
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	-	8.70	-
E2	9.63	10.00	10.35
E3	7.00	8.00	8.40
e		0.37	
e1		0.10	
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	-	3.10	3.40
Phi p	3.45	3.60	3.75
Q	2.60	2.80	3.00
theta 1	4°	7°	10°
theta 2	0°	3°	6°
F	13.30	13.50	13.70
F1	15.50	15.90	16.30
F2	2.80	3.00	3.20



Package Mechanical Data-TO-263-3L-SLK



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
θ1	4°	7°	10°
θ2	0°	3°	6°



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