80V N-Channel Power MOSFET

FEATURES

·UItra-low $R_{DS(ON)}$

·Low Gate Charge.

·100% UIS Tested, 100% Rg Tested

·Halogen-free; RoHS-compliant

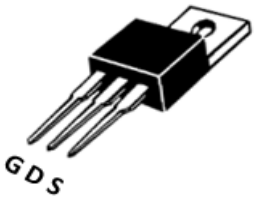
V_{DSS}	80V
I_D @V_{GS}=10V	154A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	4.0mΩ

TYPICAL APPLICATIONS：

·Power Managerment in Telecom., Industrial Automation, CE.

·Current Switching in DC/DC & AC/DC (SR) Sub-systems

·Motor Driving in Power Tool, E-vehicle, Robotics



TO-220

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	154 97	A
Pulsed Drain Current (2)		I_{DM}	465	A
Avalanche Energy(3)		E_{AS}	423	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	208 83	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

NOTES:

1. Computed continuous current assumes the condition of T_{J_MAX} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_MAX} = 150℃.
3. E_{AS} of 864mJ is based on starting T_{J_MAX} = 50℃,L = 3mH, I_{AS}=16.8A, V_{GS}=10V, V_{DD} = 40V;

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction-to-Case	$R_{\theta JA}$ $R_{\theta JC}$	55 0.78	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	80			V
Zero Gate Voltage Drain Current VDS =64 V, VGS = 0 V,T_J=25℃ VDS =64 V, VGS = 0 V,T_J=55℃	I_{DSS}			1.0 5.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0	3.0	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		4.3	5.2	mΩ
Forward Transconductance VDS =5V, ID = 20A	g_{FS}		31		S
Diode Forward Voltage VGS = 0V, I_S = 1A	V_{SD}		0.70	1.0	V
Diode Forward Current	I_S			154	A
Input capacitance f=1MHz, VDS=40 V, VGS=0 V	C_{iss}		3625		pF
Output capacitance f=1MHz, VDS=40 V, VGS=0 V	C_{oss}		609		pF
Reverse transfer capacitance f=1MHz, VDS=40 V, VGS=0 V	C_{rss}		12		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		2.0		Ω
Total Gate Charge VDS= 40V, ID= 20A, VGS= 10V VDS= 40V, ID= 20A, VGS= 6V	Q_G		52 32		nC
Gate to Source Charge VDS= 40V, ID= 20A, VGS= 0 to 10V	Q_{GS}		20		nC
Gate to Drain Charge VDS= 40V, ID= 20A, VGS= 0 to 10V	Q_{GD}		10.1		nC
Turn-on delay time VDS= 40V, VGS= 10V, R_L=2.0Ω, R_{GEN}=3Ω	$t_{d\ (ON)}$		17		ns
Rise time VDS= 40V, VGS= 10V, R_L=2.0Ω, R_{GEN}=3Ω	tr		31		ns
Turn-off delay time VDS= 40V, VGS= 10V, R_L=2.0Ω, R_{GEN}=3Ω	$t_{d\ (OFF)}$		33		ns
Fall time VDS= 40V, VGS= 10V, R_L=2.0Ω, R_{GEN}=3Ω	tf		12		ns
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr		56		ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		104		nC

Typical Performance Characteristics

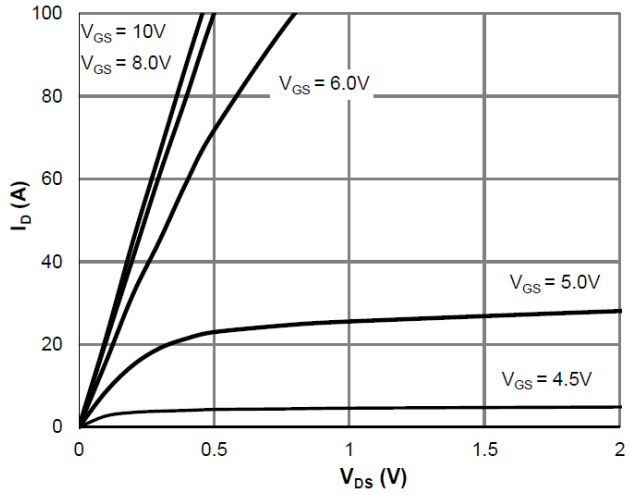


Figure 1. Saturation Characteristics

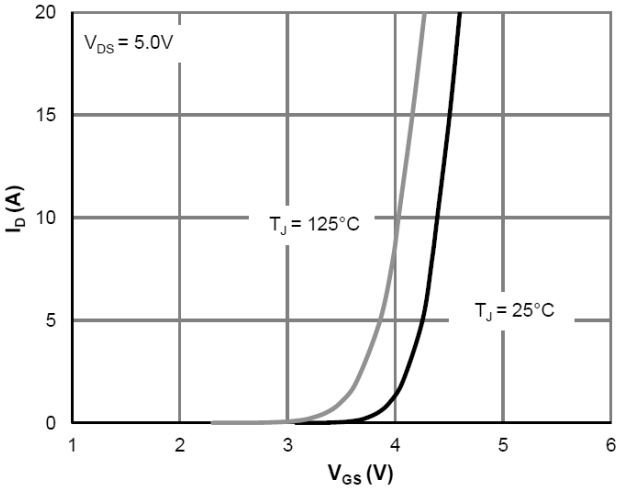


Figure 2. Transfer Characteristics

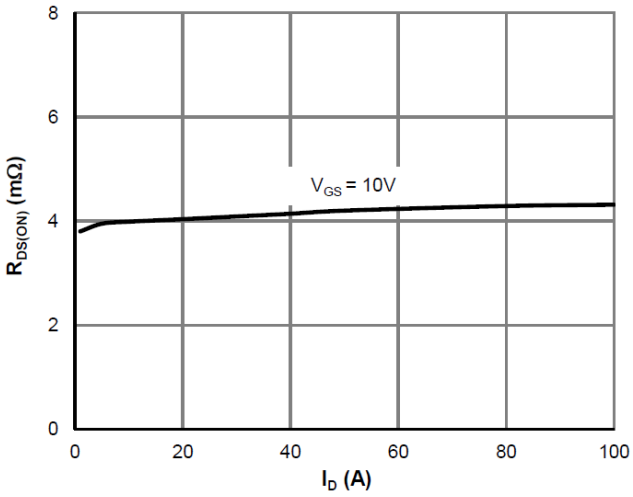


Figure 3. $R_{DS(ON)}$ vs. Drain Current

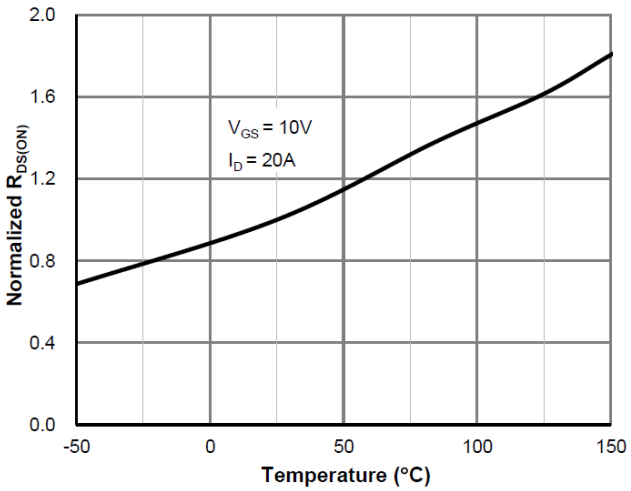


Figure 4. $R_{DS(ON)}$ vs. Junction Temperature

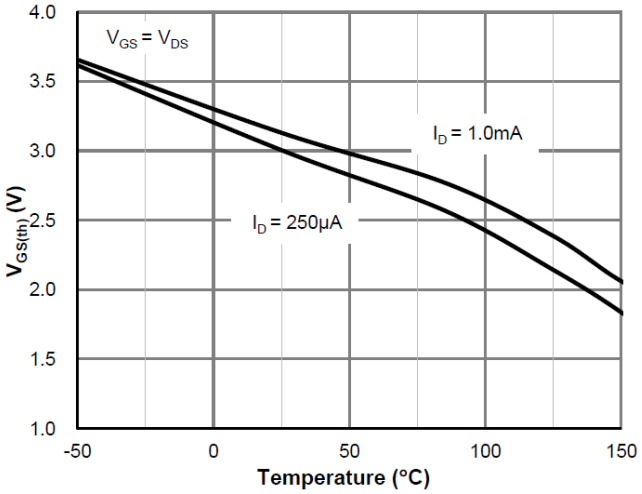


Figure 5. $V_{GS(th)}$ vs. Junction Temperature

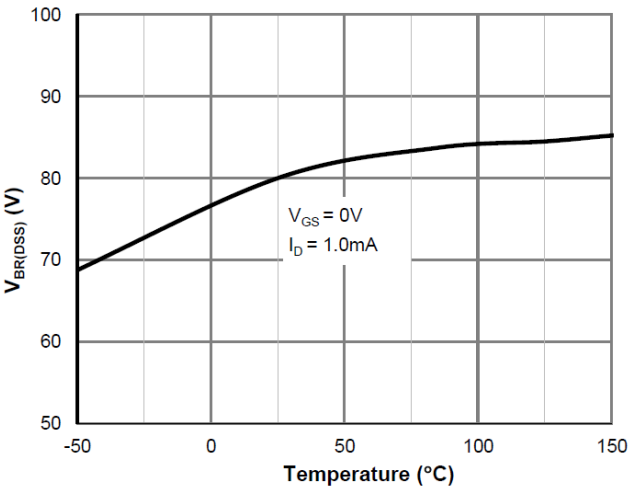


Figure 6. $V_{BR(DSS)}$ vs. Junction Temperature

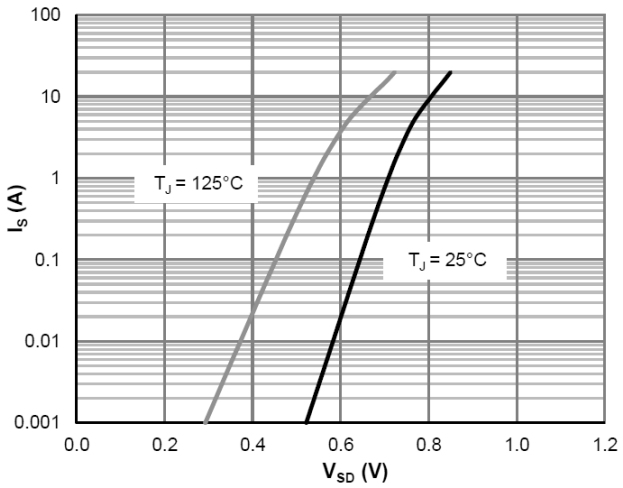


Figure 7. : Body Diode Characteristics

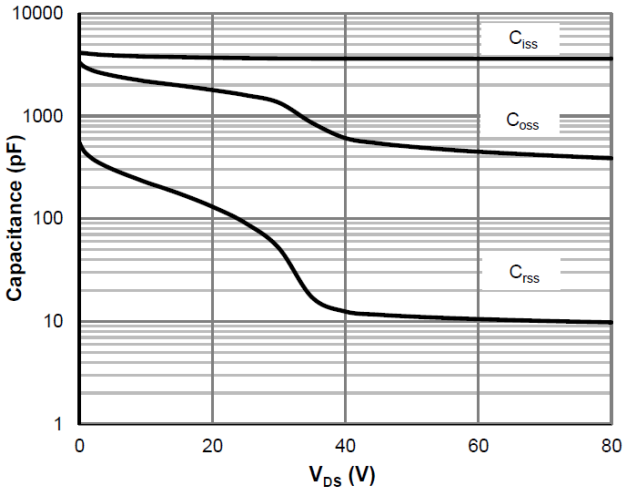


Figure8. Capacitance Characteristics

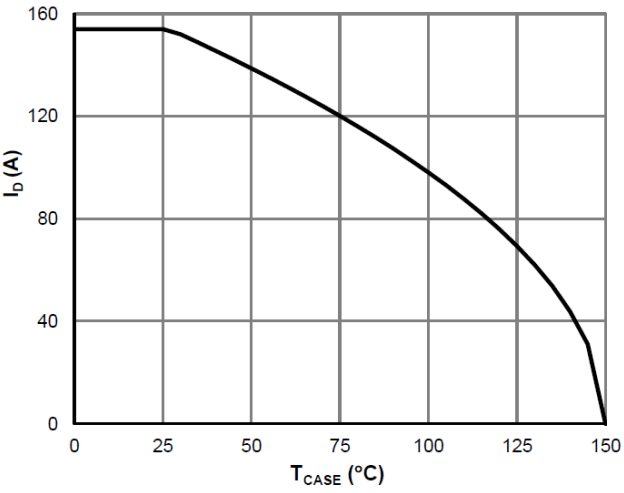


Figure 9. Current De rating

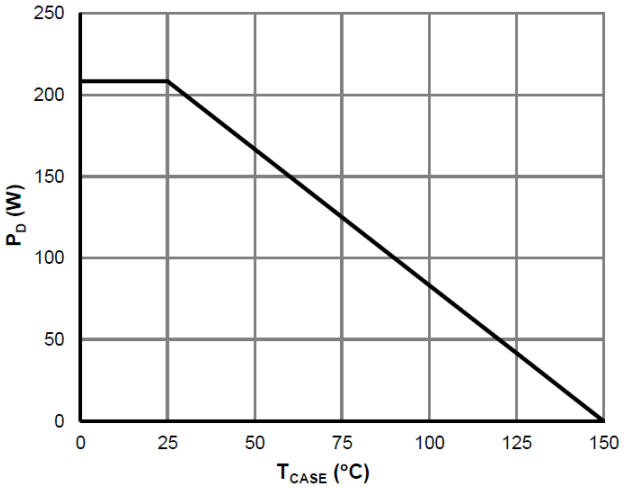


Figure 10. Power De rating

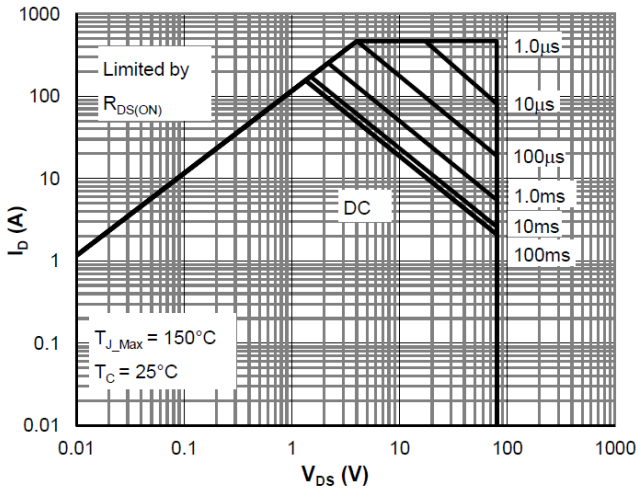


Figure 11. Maximum Safe Operating Area

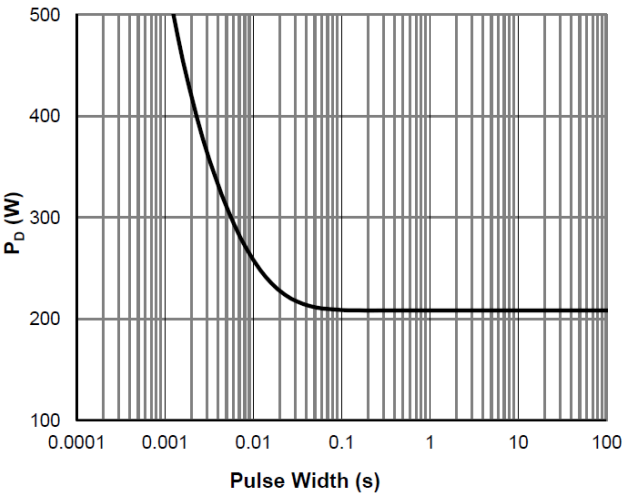


Figure 12. Single Pulse Power Rating, Junction-To-Case

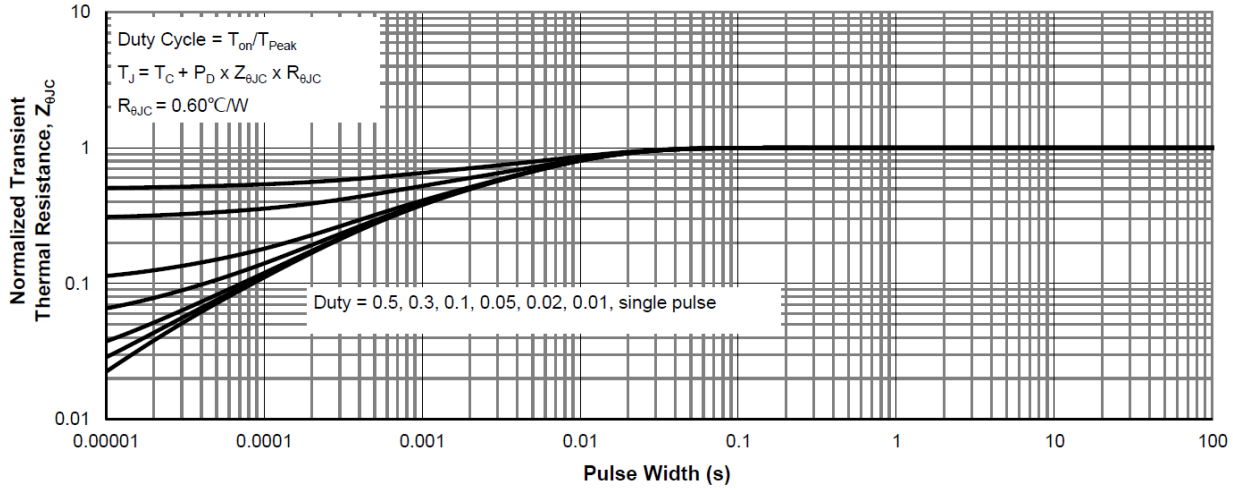
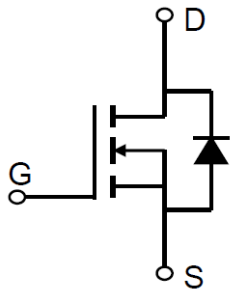
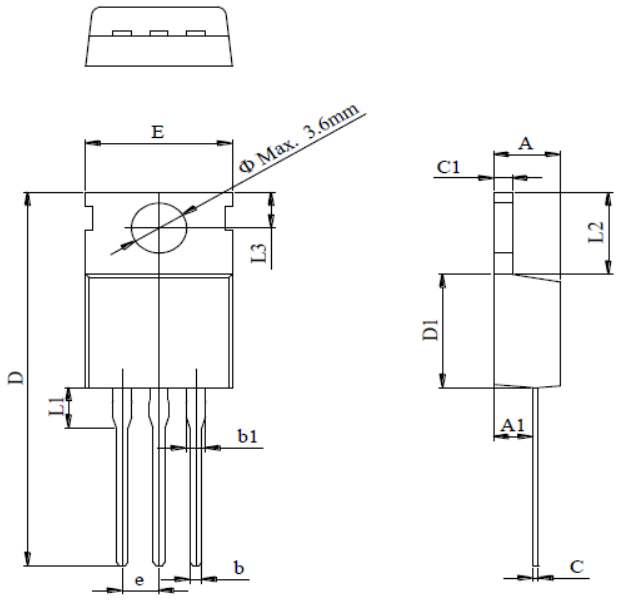


Figure 13. Normalized Maximum Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.70
A1	2.20		3.00
b	0.70		0.95
b1	1.14		1.70
C	0.40		0.60
C1	1.15		1.40
D	28.00		29.80
D1	8.80		9.90
E	9.70		10.50
L1			3.80
L2	6.25		6.90
L3	2.40		3.00
e		2.54 BSC	

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