N-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	40V
$R_{DSON(MAX.)}$	0.0071
I_D	80A

FEATURES

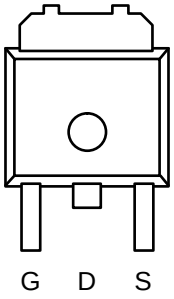
- TrenchFET Power MOSFET
- 100 % R_g and UIS Tested

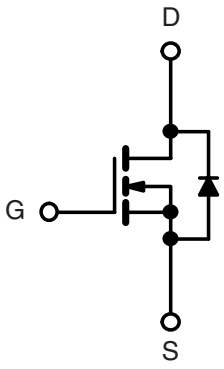
RoHS COMPLIANT

APPLICATIONS

- Synchronous Rectification
- Power Supplies

TO-252





N-Channel MOSFET

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 °C	I_D	80	A
	T_C = 100 °C		38	
Pulsed Drain Current		I_{DM}	240	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	100	mJ
Total Power Dissipation	T_C = 25 °C	P_D	113.6	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	-	1.1	°C / W

Electrical Characteristics T_J = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V , I_D = 250 μA	40	-	-	V
Gate-body Leakage current	I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40 V , V_{GS} = 0 V , T_J = 25 °C	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 μA	1.2		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V , I_D = 20 A	-	0.0057	0.0071	Ω
		V_{GS} = 4.5 V , I_D = 15 A	-	0.0085	0.0106	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 20 V , V_{GS} = 0 V , f = 1 MHz	-	2445	-	pF
Output Capacitance	C_{oss}		-	169	-	
Reverse Transfer Capacitance	C_{rss}		-	140	-	
Switching Characteristics						
Total Gate Charge	Q_g	V_{GS} = 10 V , V_{DS} = 30 V , I_D = 50 A	-	47	70	nC
Gate-Source Charge	Q_{gs}		-	10	-	
Gate-Drain Charge	Q_{gd}		-	12	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 20 V , $I_D \cong$ 20 A , V_{GEN} = 10 V , R_{GEN} = 3 Ω	-	12	-	nS
Rise Time	t_r		-	30	-	
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	
Fall Time	t_f		-	9	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S = 30 A , V_{GS} = 0 V	-	-	1.2	V
Continuous Source-Dranin Diode Current	I_S	T_J = 25 °C	-	-	80	A
Continuous Source Current	I_{SM}		-	-	240	A
Reverse Recovery Charge	Q_{rr}	T_J = 25 °C , I_F = 20 A , dI/dt = 100 A/μs	-	13	-	nC
Reverse Recovery Time	t_{rr}		-	5	-	ns

Notos:

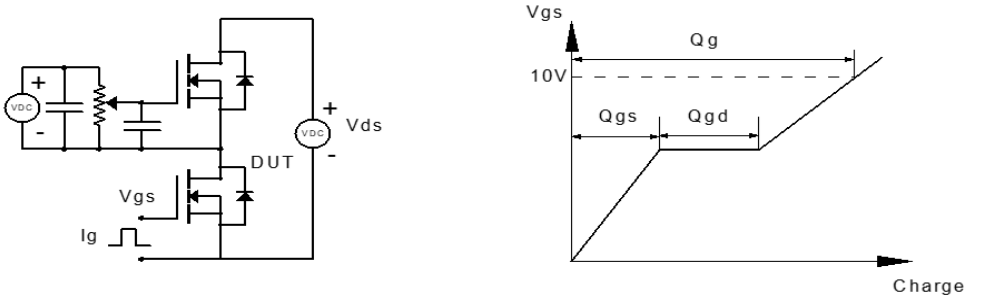
a. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

b. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=20A

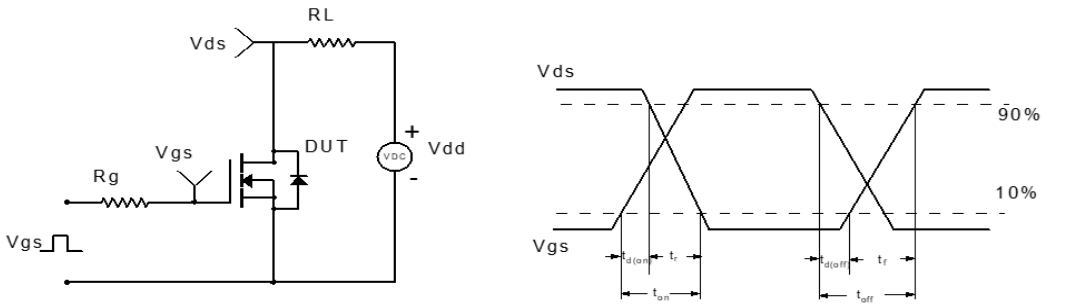
c. $R_{\theta}JA$ is measured with the device mounted on a 1inch2 pad of 2oz copper FR4 PCB

d. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

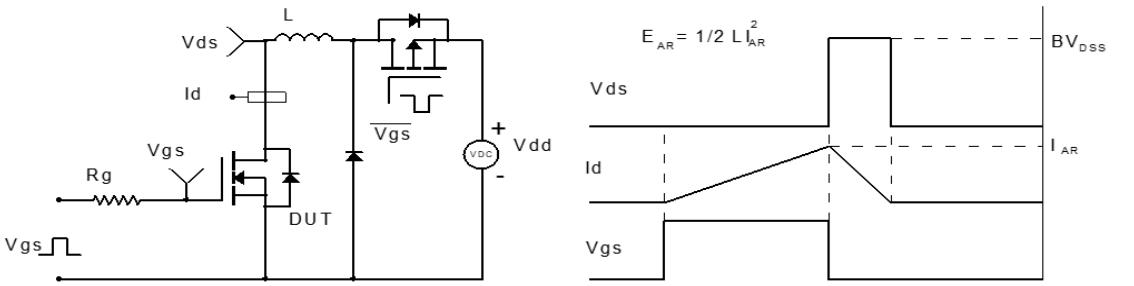
Test circuit and Waveform



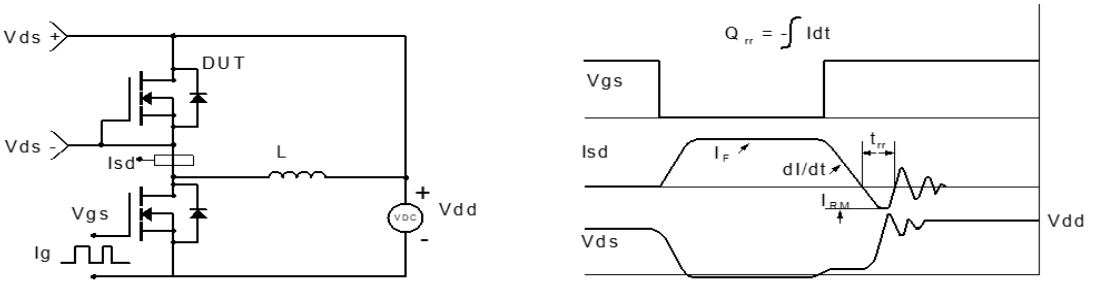
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform

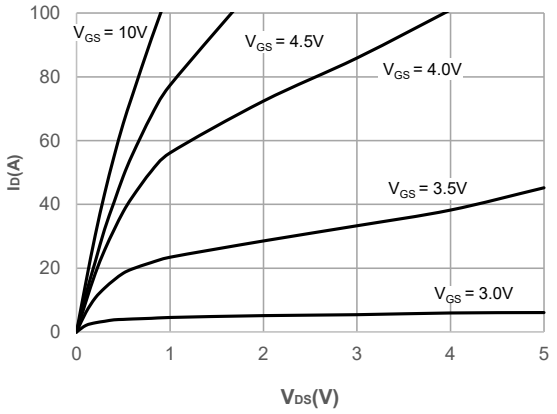


Unclamped Inductive Switching Test Circuit& Waveform

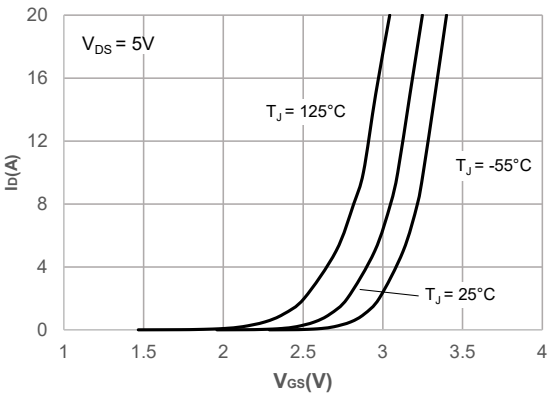


Diode Recovery Test Circuit & Waveform

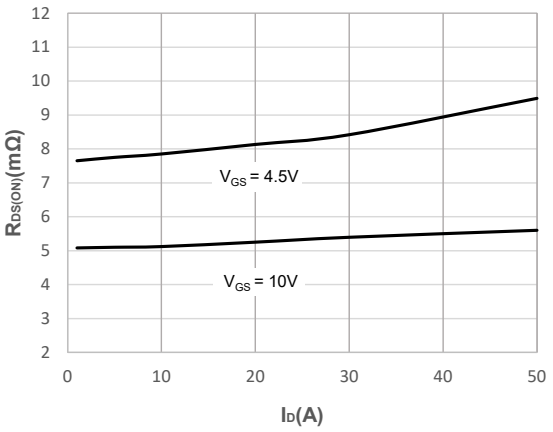
TYPICAL CHARACTERISTICS (25 °C unless noted)



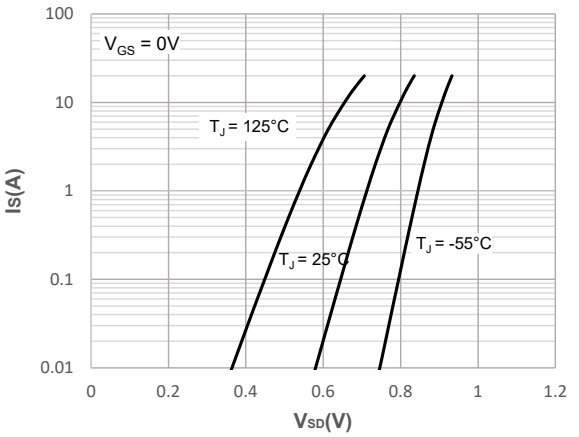
Output Characteristics



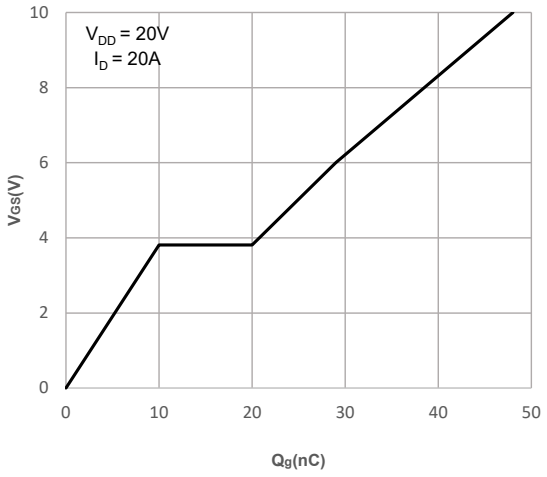
Typical Transfer Characteristics



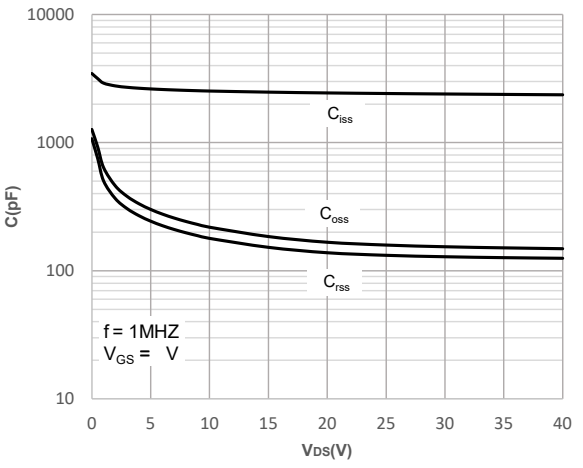
On-resistance vs. Drain Current



Body Diode Characteristics

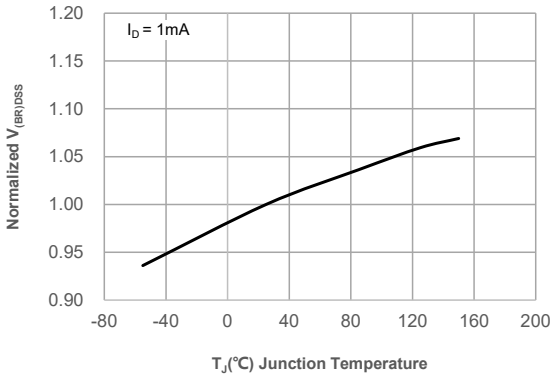


Gate Charge Characteristics

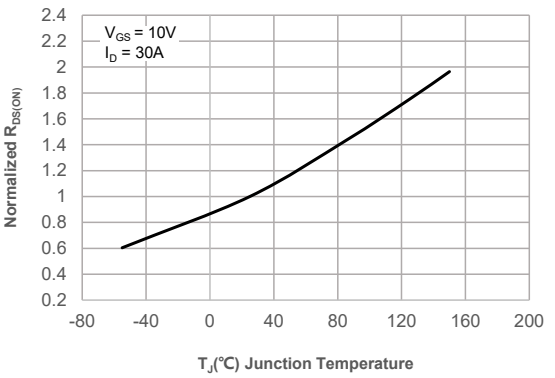


Capacitance Characteristics

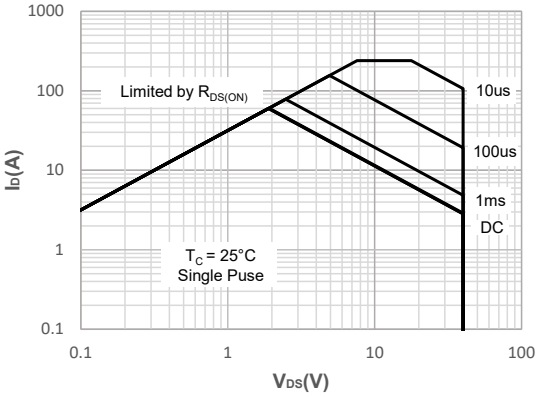
TYPICAL CHARACTERISTICS (25 °C unless noted)



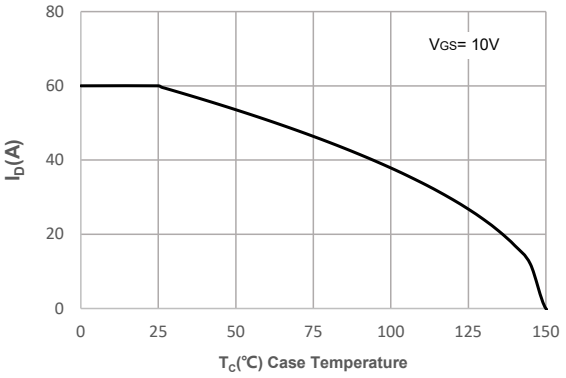
Normalized Breakdown voltage vs. Junction Temperature



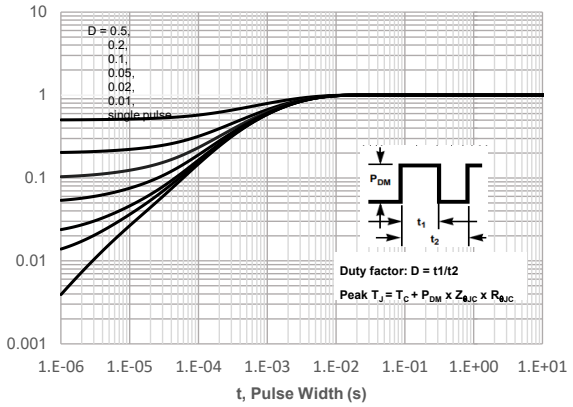
Normalized on Resistance vs. Junction Temperature



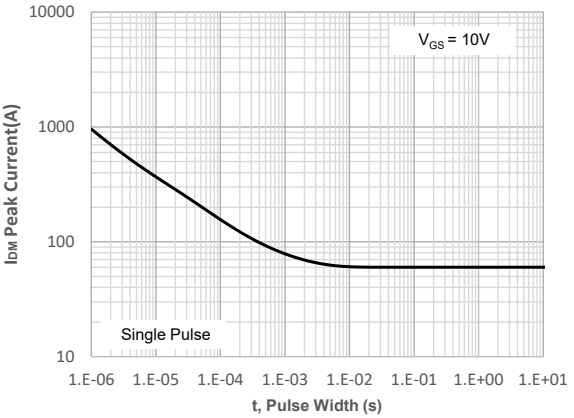
Maximum Safe Operating Area



Maximum Continuous Drian Current vs. Case Temperature



Normalized Maximum Transient Thermal Impedance



Peak Current Capacity

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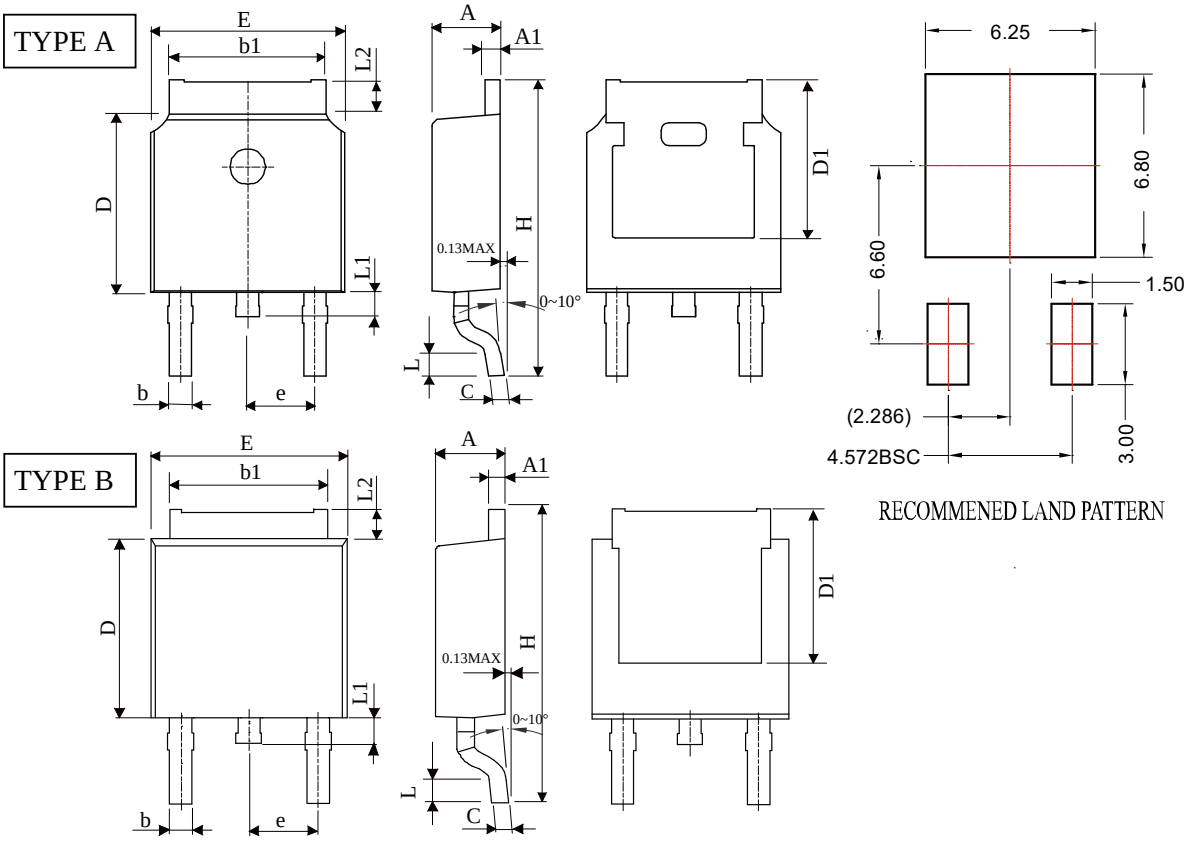

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.094
A1	0.45	0.89	0.018	0.035
b	0.50	0.90	0.019	0.035
b1	4.95	5.59	0.195	0.220
C	0.40	0.61	0.016	0.024
D	5.40	6.63	0.213	0.261
E	6.05	7.10	0.238	0.280
e	1.98	2.59	0.078	0.102
H	8.80	10.6	0.346	0.417
L	0.25	1.350	0.010	0.053
L1	0.50	1.20	0.020	0.047
L2	0.70	1.78	0.028	0.070
D1	5.00	5.60	0.197	0.220