P-Channel -30 V (D-S) MOSFET

PRODUCT SUMMARY

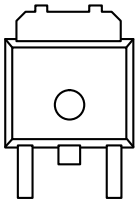
BV_{DSS}	-30V
$R_{DSON(MAX.)}$	0.025Ω
I_D	-40A

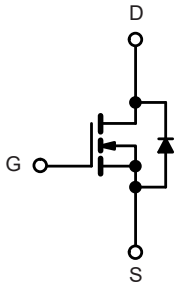
FEATURES

- TrenchFET Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested

RoHS COMPLIANT

TO-252





N-Channel MOSFET

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 ℃	I_D	-40	A
	T_C = 100 ℃		-17	
Pulsed Drain Current		I_{DM}	-80	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	35	mJ
		I_{AS}	-10	A
Continuous Source-Drain Diodes Current	T_C = 25 ℃	I_S	80	A
	T_A = 25 ℃		60	
Total Power Dissipation	T_C = 25 ℃	P_D	31.3	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	℃

Thermal Characteristics

Parameter		Symbol	LIMIT.	Unit
Thermal resistance, junction-to-ambient	t ≤ 10 s	$R_{\theta JA}$	62	℃/W
Thermal resistance, junction-to-case	Steady State	$R_{\theta JC}$	4	

Electrical Characteristics T_J = 25℃, 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	-30	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J = 25℃	I_{DSS}	V_{DS} = -30 V , V_{GS} = 0 V	-	-	-1	µA
Gate-Threshold Voltage		$V_{GS}(th)$	V_{DS} = V_{GS} , I_D = 250 µA	-1		-2.5	V
Drain-Source On-Resistance		$R_{DS}(on)$	V_{GS} = - 10 V , I_D = - 9 A	-	0.019	0.025	Ω
			V_{GS} = - 4.5 V , I_D = - 27 A	-	0.027	0.035	
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS} = - 15 V , V_{GS} = 0 V , f = 1 MHz	-	1202	-	pF
Output Capacitance		C_{oss}		-	157	-	
Reverse Transfer Capacitance		C_{rss}		-	141	-	
Switching Characteristics							
Total Gate Charge		Q_g	V_{GS} = - 10 V , V_{DS} = - 15 V , I_D = - 8 A	-	54	-	nC
Gate-Source Charge		Q_{gs}		-	10	-	
Gate-Drain Charge		Q_{gd}		-	8.5	-	
Turn-On Delay Time		$t_d(on)$	V_{DD} = - 15 V , I_D ≅ - 1 A , V_{GEN} = - 10 V , R_G = 6 Ω	-	15	-	nS
Rise Time		t_r		-	17	-	
Turn-Off Delay Time		$t_d(off)$		-	200	-	
Fall Time		t_f		-	100	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage		V_{SD}	I_S = -9 A , V_{GS} = 0 V	-	-0.8	-1.2	V
Continuous Source-Dranin Diode Current		I_S	T_J = 25 °C	-	-	-35	A
Pulse Diode Forward Currnt		I_{SM}		-	-	-80	

Notes:

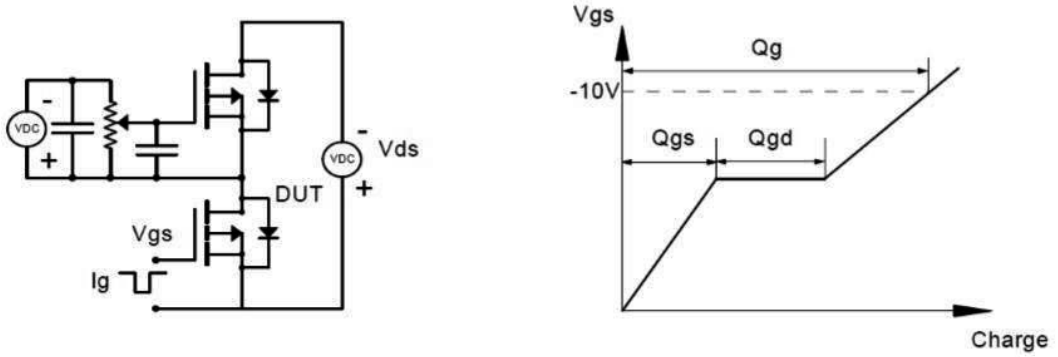
a. RepetitiveRating:PulseWidthLimitedbyMaximumJunctionTemperature.

b. E_{AS}condition:T_J=25°C,V_{DD}=-15V,V_G=-10V,R_G=25Ω,L=0.5mH, I_{AS}=-10A.

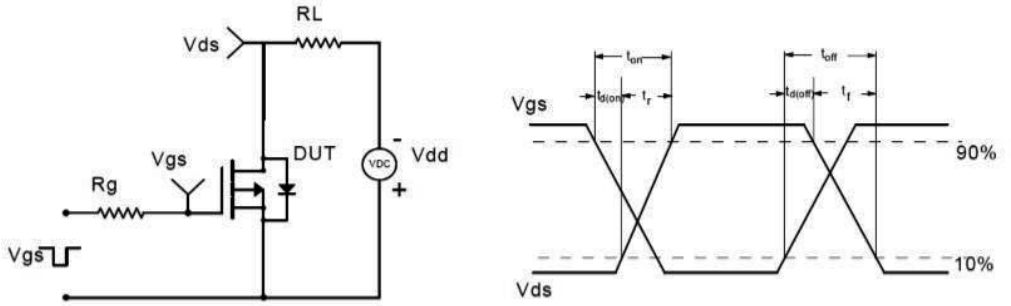
c. PulseTest:PulseWidth≤300µs,DutyCycle≤2%.

Test Circuit

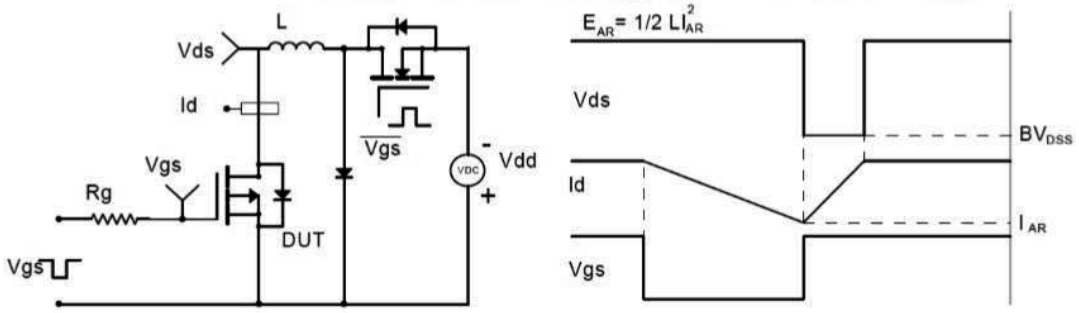
Gate Charge Test Circuit & Waveform



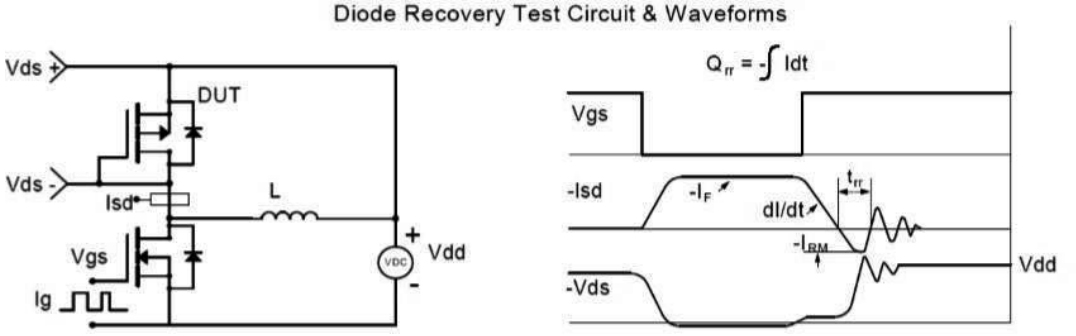
Resistive Switching Test Circuit & Waveforms



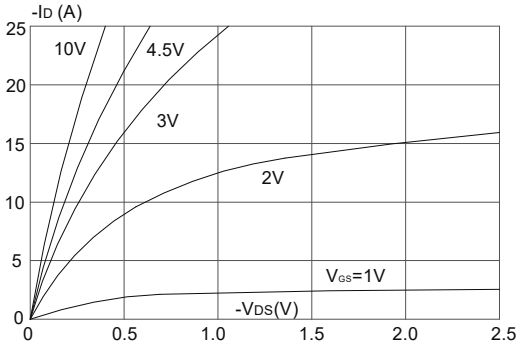
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



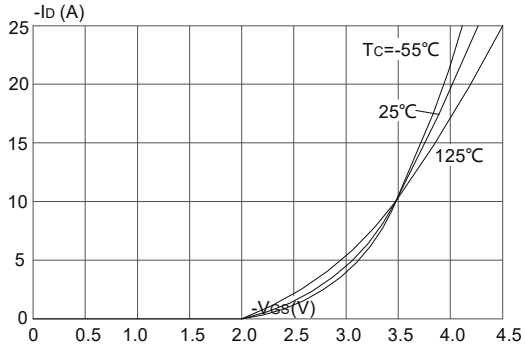
Diode Recovery Test Circuit & Waveforms



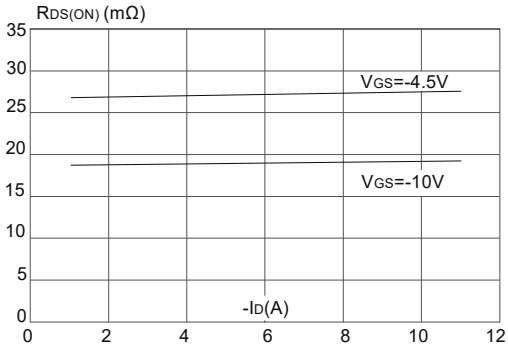
Typical Performance Characteristics



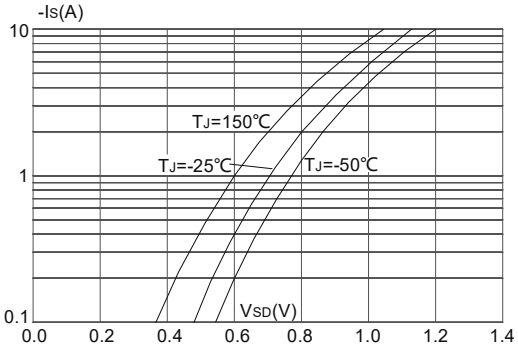
Output Characteristics



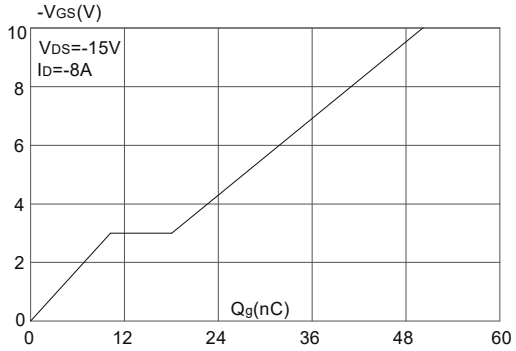
Typical Transfer Characteristics



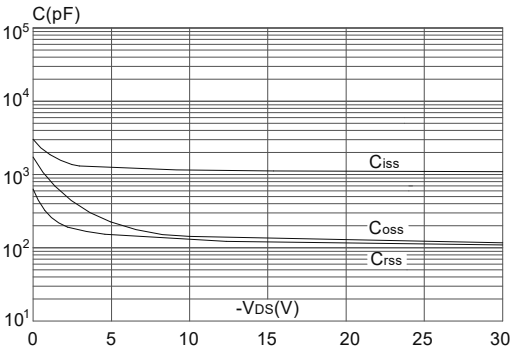
On-resistance vs. Drain Current



Body Diode Characteristics

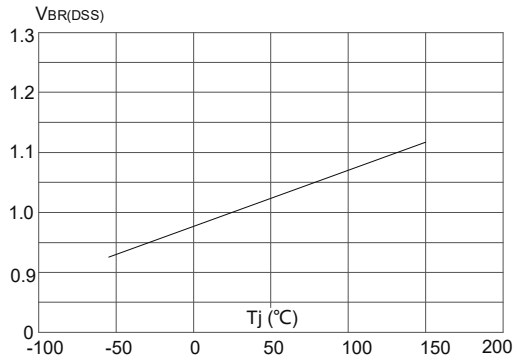


Gate Charge Characteristics

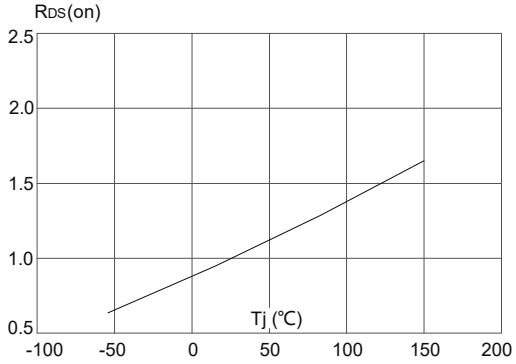


Capacitance Characteristics

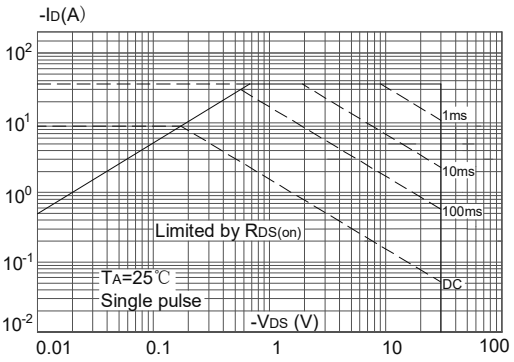
Typical Performance Characteristics



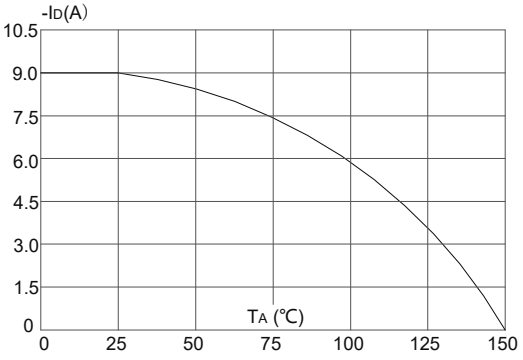
Normalized Breakdown Voltage vs. Junction Temperature



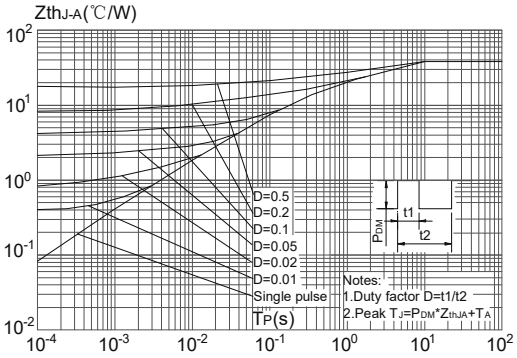
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area



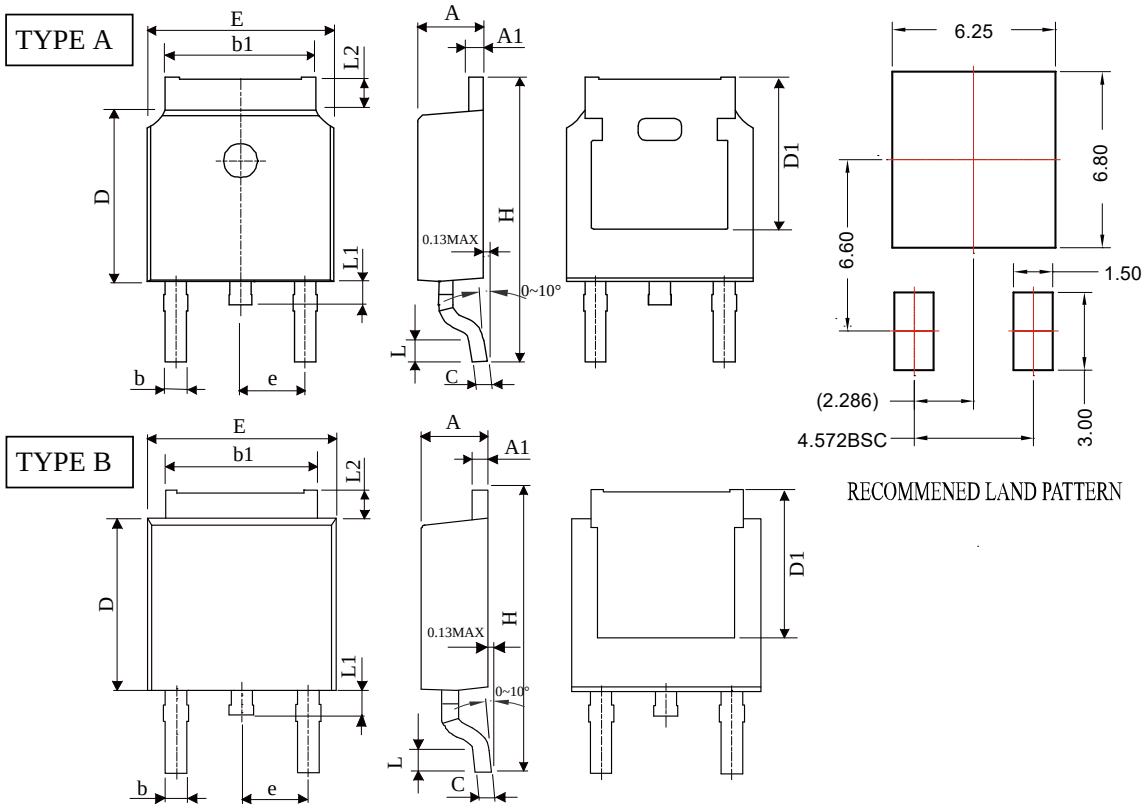
Maximum Continuous Drain Current vs. Ambient Temperature



Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

TO-252

Unit: mm



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