

Features

- Split Gate Trench MOSFET Technology
- AEC-Q101 Qualified
- Moisture Sensitivity Level 1
- Extremely Low Switching Loss
- Fast Switching and Soft Recovery
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1.7°C/W Junction to Case (Steady-State)
- Thermal Resistance: 20°C/W Junction to Ambient ($t \leq 10s$)⁽¹⁾
- Thermal Resistance: 50°C/W Junction to Ambient (Steady-State)⁽¹⁾

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	45	A
Pulsed Drain Current ⁽²⁾	I_{DM}	180	A
Total Power Dissipation ⁽³⁾	P_D	72	W
Single Pulsed Avalanche Energy ⁽⁴⁾	E_{AS}	81	mJ

Note:

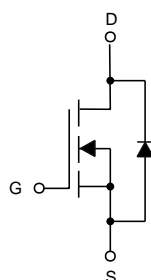
1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} t \leq 10s$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

2. Repetitive rating; pulse width limited by max. junction temperature.

3. P_D is based on max. junction temperature, using junction-case thermal resistance.

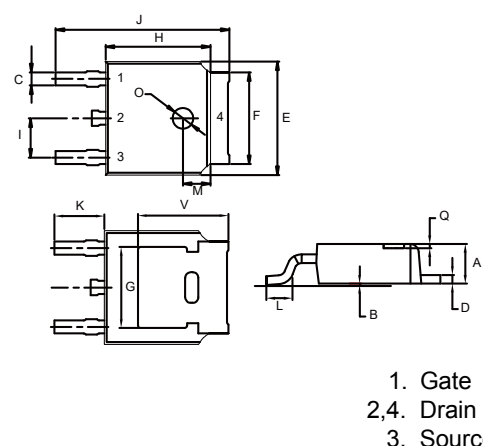
4. $V_{DD}=50V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=25A$.

Internal Structure



N-CHANNEL MOSFET

DPAK(TO-252)



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		TYP.
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		TYP.
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		TYP.
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		TYP.

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	100			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.8	3	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		14	17	mΩ
		V _{GS} =4.5V, I _D =20A		17	21.5	mΩ
Gate Resistance	R _g	f=1MHz, Open drain		1		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				40	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.3	V
Reverse Recovery Time	t _{rr}	I _S =20A, dI _F /dt=100A/μs		39.8		ns
Reverse Recovery Charge	Q _{rr}			42		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz		1135		pF
Output Capacitance	C _{oss}			399		
Reverse Transfer Capacitance	C _{rss}			18		
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =25A		16		nC
Gate-Source Charge	Q _{gs}			5.6		
Gate-Drain Charge	Q _{gd}			2.4		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =50V, I _D =25A R _{GEN} =2.2Ω		39.2		ns
Turn-On Rise Time	t _r			11		
Turn-Off Delay Time	t _{d(off)}			53.2		
Turn-Off Fall Time	t _f			15.8		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

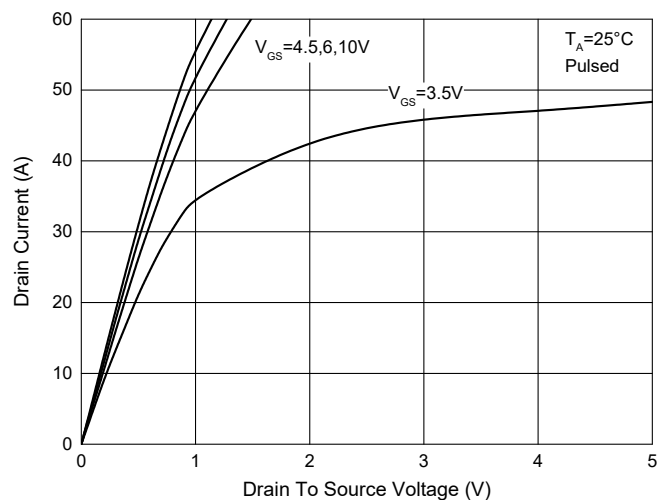


Fig. 2 - Transfer Characteristics

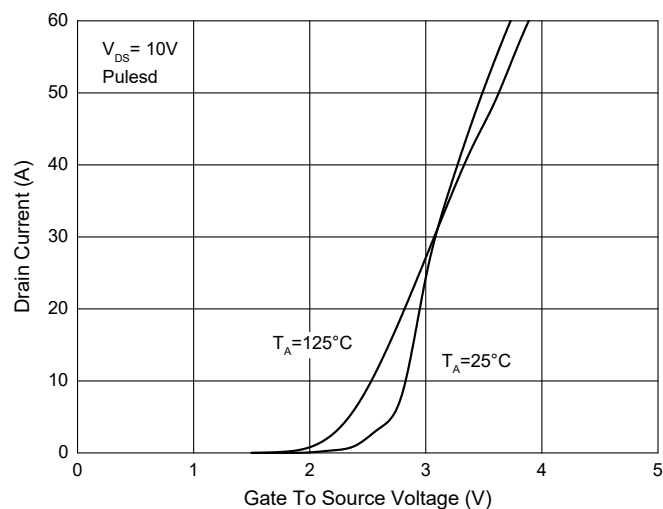


Fig. 3 - $R_{DS(ON)} - I_D$

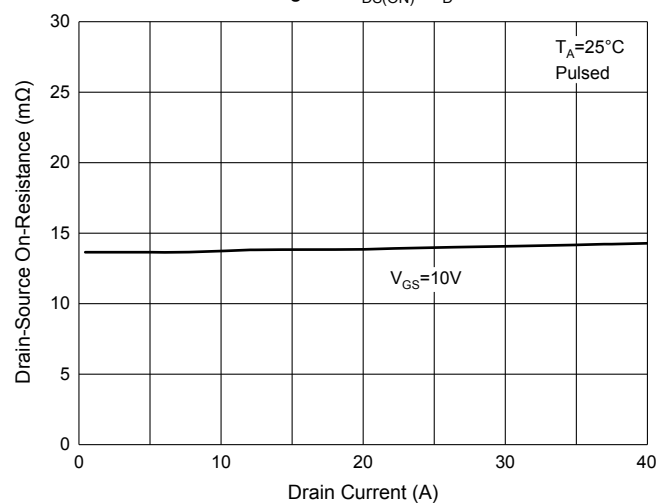


Fig. 4 - Normalized On Resistance Characteristics

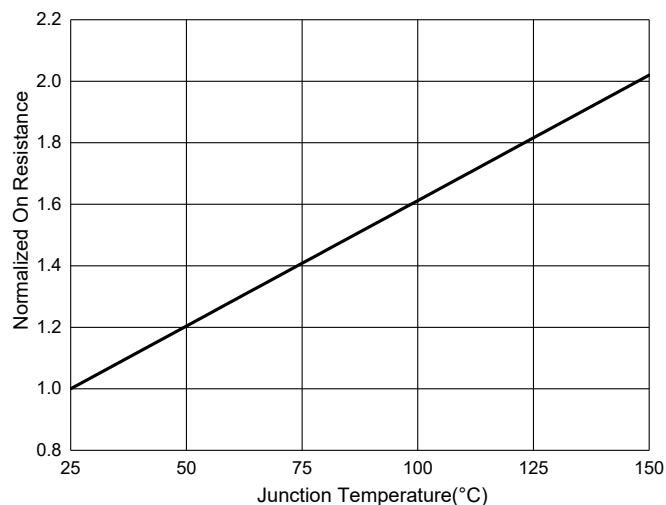


Fig. 5 - Capacitance Characteristics

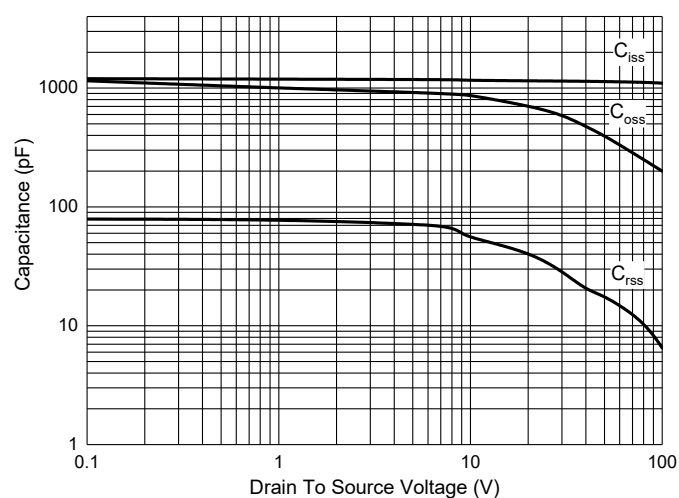
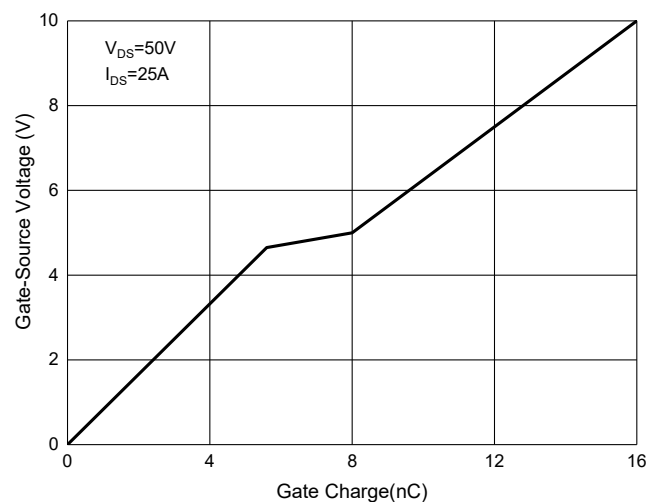
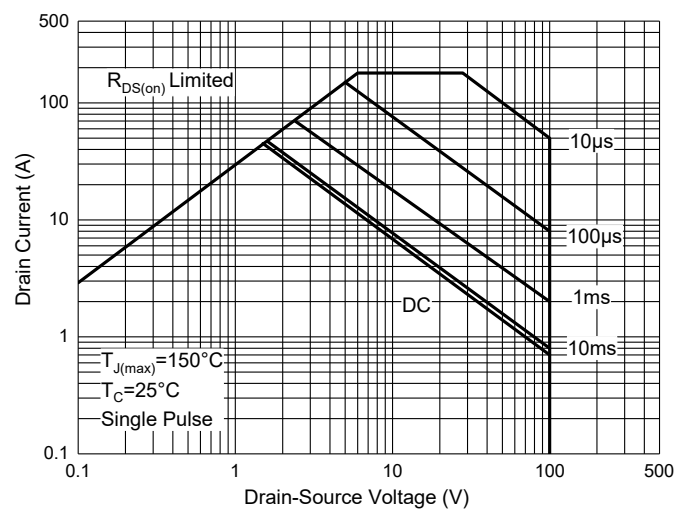


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Safe Operation Area



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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