

### Features

- High Density Cell Design for Ultra Low  $R_{DS(on)}$
- Fully Characterized Avalanche Voltage and Current
- Good Stability and Uniformity With High EAS
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

# N-CHANNEL MOSFET

### Maximum Ratings

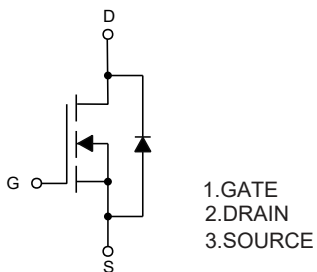
- Operating Junction Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Storage Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Thermal Resistance:  $100^{\circ}\text{C/W}$  Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	40	V
Gate -Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	60	A
Drain Current-Pulsed	$I_{DM}$	240	A
Power Dissipation	$P_D$	1.25	W
Single Pulsed Avalanche Energy <sup>(Note1)</sup>	$E_{AS}$	400	mJ

## DPAK

DIMENSIONS					NOTE
DIM	INCHES		MM		
	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.

### Internal Structure



**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)**

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Gate-Threshold Voltage <sup>(Note2)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.5	2.5	V
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			1	$\mu A$
Drain-Source On-Resistance <sup>(Note2)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		8	13	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		10.5	20	
Forward Transconductance <sup>(Note2)</sup>	$g_{FS}$	$V_{DS}=25V, I_D=20A$	24			S
<b>Dynamic Characteristics<sup>(Note3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V, f=1MHz$		1800		pF
Output Capacitance	$C_{oss}$			280		
Reverse Transfer Capacitance	$C_{rss}$			190		
<b>Switching Characteristics<sup>(Note3)</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS}=20V, V_{GS}=10V, I_D=20A$		29		nC
Gate-Source Charge	$Q_{gs}$			4.5		
Gate-Drain Charge	$Q_{gd}$			6.4		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, R_G=3\Omega, I_D=2A, R_L=1\Omega,$		6.4		ns
Turn-on Rise Time	$t_r$			17.2		
Turn-off Delay Time	$t_{d(off)}$			29.6		
Turn-off Fall Time	$t_f$			16.8		
<b>Drain-Source Diode Characteristics</b>						
Drain-Source Diode Forward Voltage <sup>(Note 2)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=20A$			1.2	V
Continuous Drain-Source Diode Forward Current	$I_S$				60	A
Pulsed Drain-Source Diode Forward Current	$I_{SM}$				240	A

Notes:

1.  $E_{AS}$  Condition:  $V_{DD}=20V, L=0.5mH, R_G=25\Omega$ , Starting  $T_J = 25^\circ C$
2. Pulse Test : Pulse Width $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Guaranteed by Design, Not Subject to Production.

**Curve Characteristics**

Fig. 1 - Output Characteristics

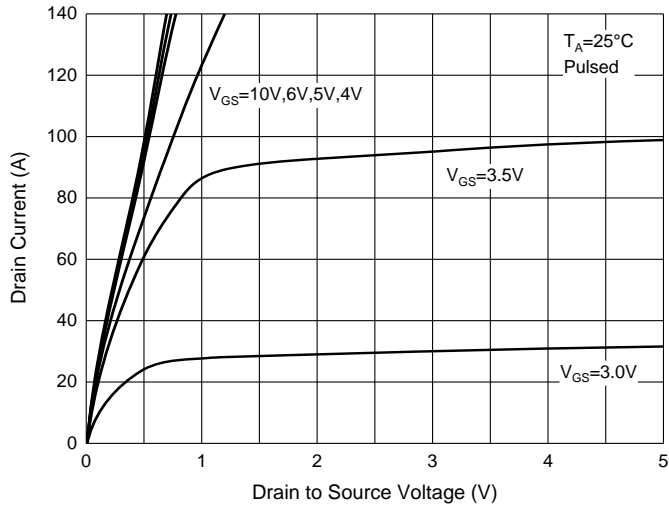


Fig. 2 - Transfer Characteristics

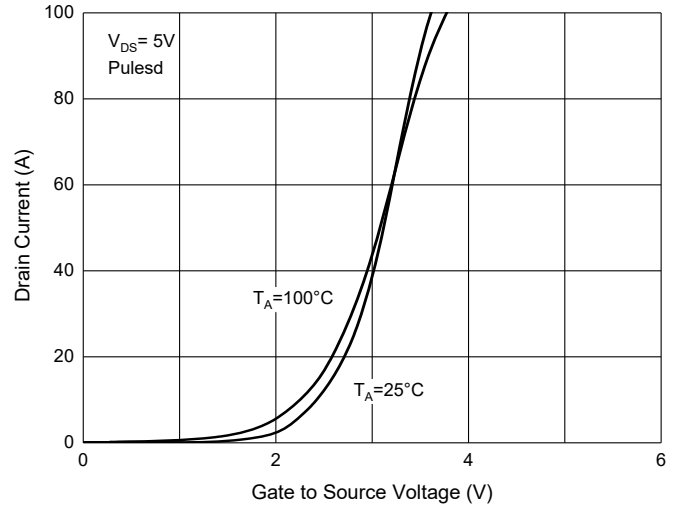


Fig. 3 -  $R_{DS(ON)} - I_D$

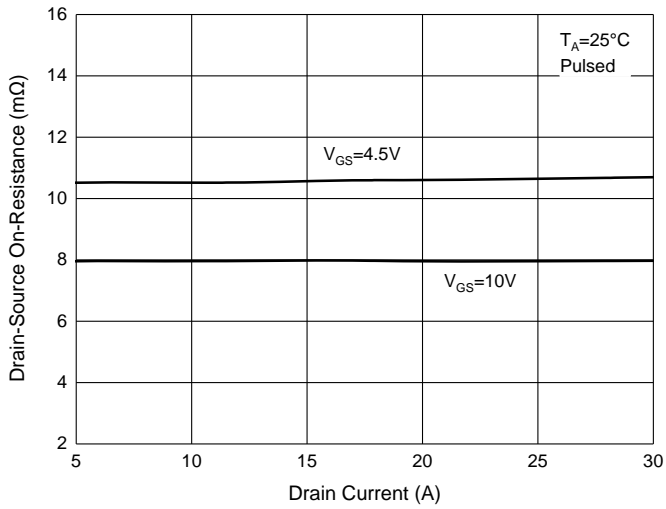


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

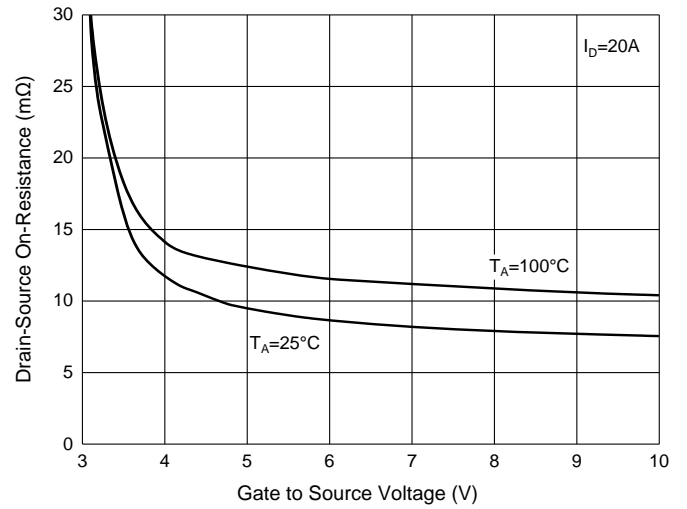


Fig. 5 -  $I_S - V_{SD}$

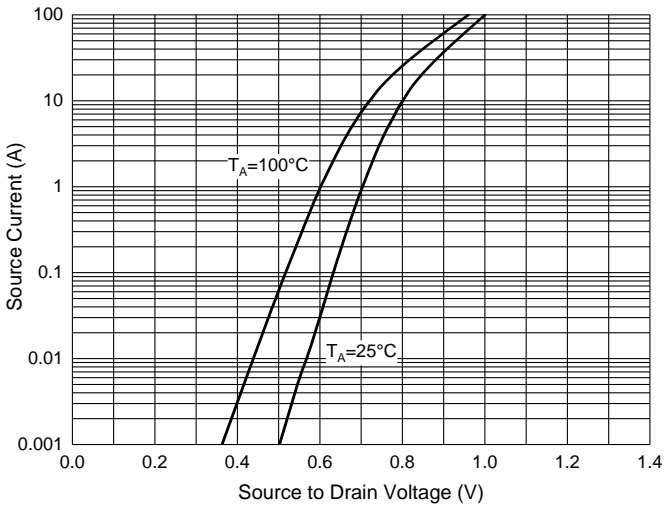
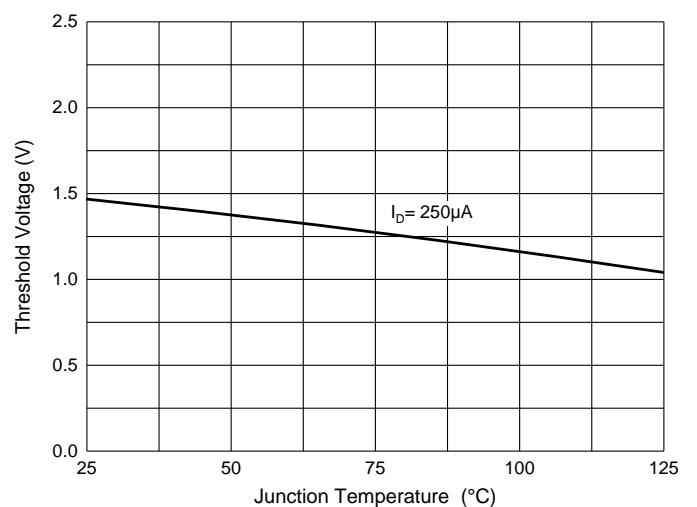


Fig. 6 - Threshold Voltage



## 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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