

## P-Channel 60-V (D-S) MOSFET

### Key Features:

- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

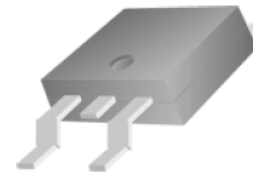
### Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

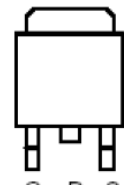
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-60	6 @ $V_{GS} = -10V$	-90
	7 @ $V_{GS} = -4.5V$	



RoHS  
COMPLIANT  
HALOGEN  
FREE



TO-263



Top View

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$I_D$	-90	A
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-390	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-110	A
Power Dissipation <sup>a</sup>	$P_D$	300	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

### Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

## Electrical Characteristics

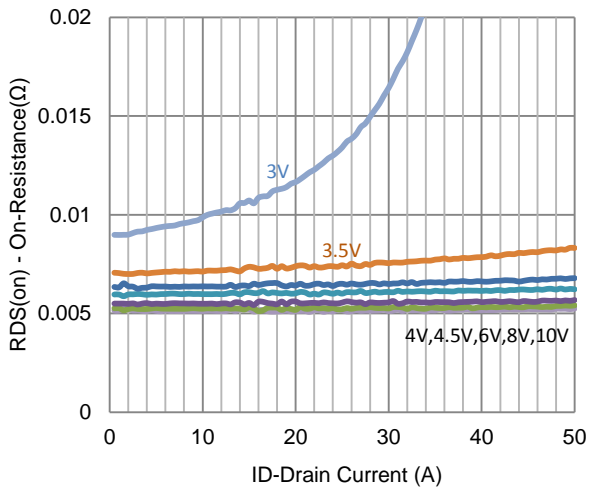
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -48 V, V_{GS} = 0 V$			-1	uA
		$V_{DS} = -48 V, V_{GS} = 0 V, T_J = 55^\circ C$			-25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-120			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -50 A$			6	m $\Omega$
		$V_{GS} = -4.5 V, I_D = -48 A$			7	
Forward Transconductance	$g_{fs}$	$V_{DS} = -15 V, I_D = -20 A$		30		S
Diode Forward Voltage	$V_{SD}$	$I_S = -55 A, V_{GS} = 0 V$		-1.04		V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS} = -30 V, V_{GS} = -4.5 V,$ $I_D = -20 A$		162		nC
Gate-Source Charge	$Q_{gs}$			52		
Gate-Drain Charge	$Q_{gd}$			70		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -30 V, R_L = 1.5 \Omega,$ $I_D = -20 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		32		ns
Rise Time	$t_r$			68		
Turn-Off Delay Time	$t_{d(off)}$			604		
Fall Time	$t_f$			222		
Input Capacitance	$C_{iss}$	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$		18517		pF
Output Capacitance	$C_{oss}$			1238		
Reverse Transfer Capacitance	$C_{rss}$			1001		

## Notes

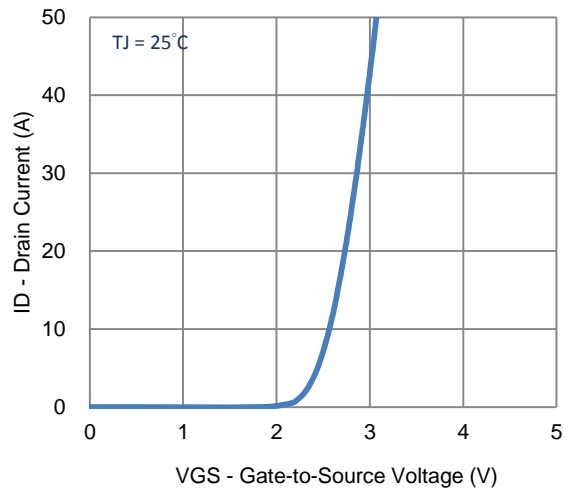
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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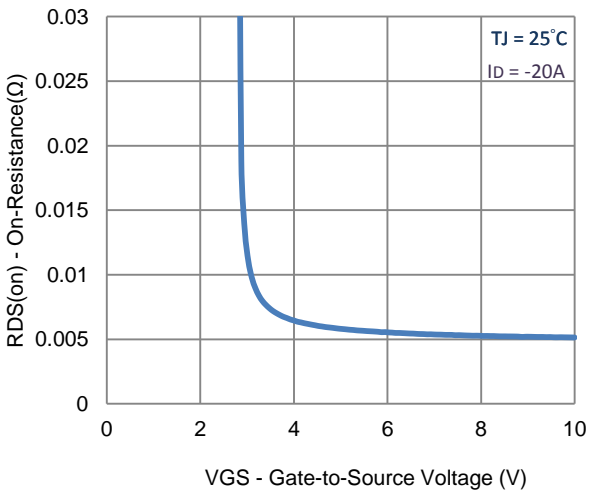
Typical Electrical Characteristics



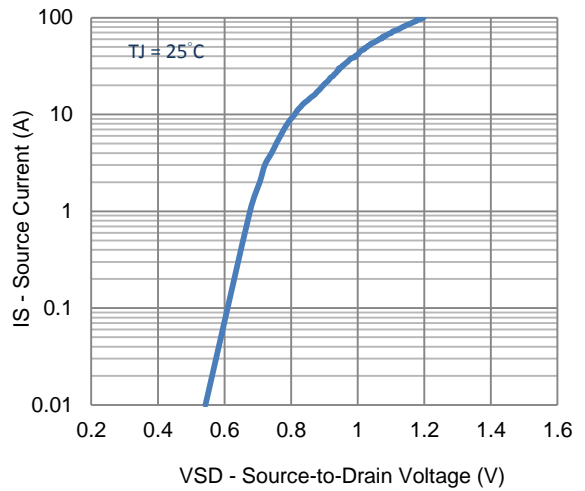
1. On-Resistance vs. Drain Current



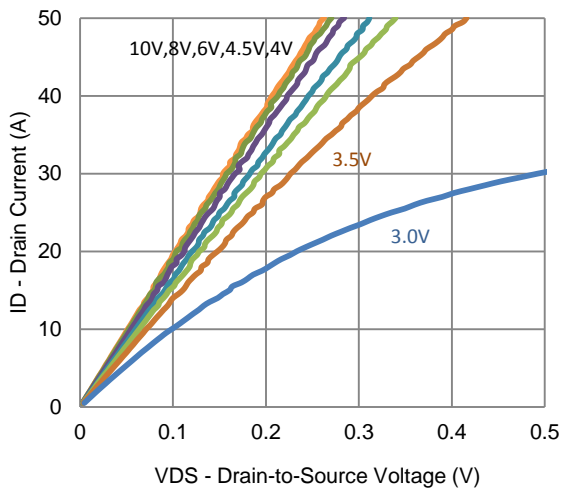
2. Transfer Characteristics



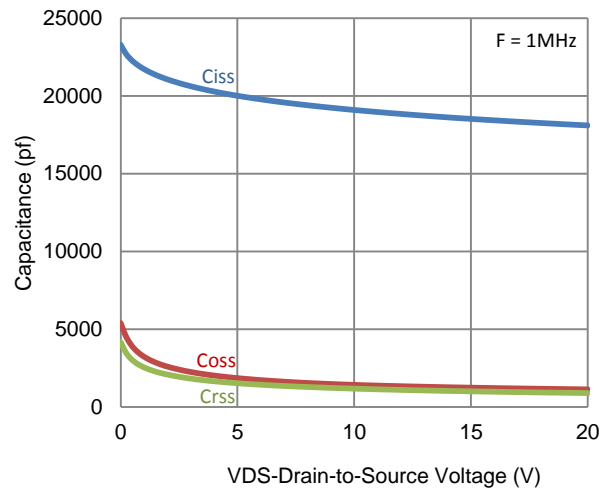
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

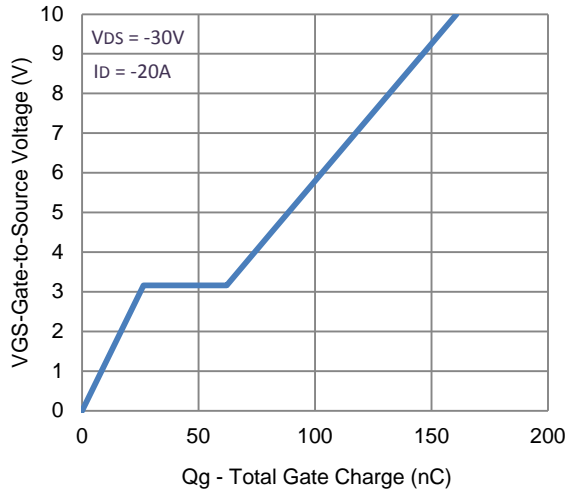


5. Output Characteristics

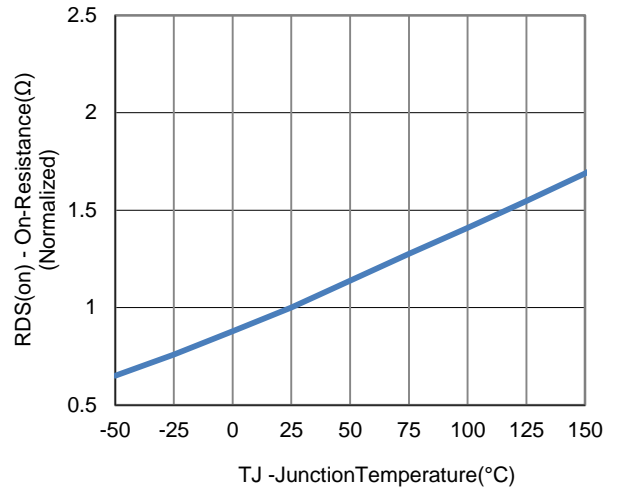


6. Capacitance

Typical Electrical Characteristics

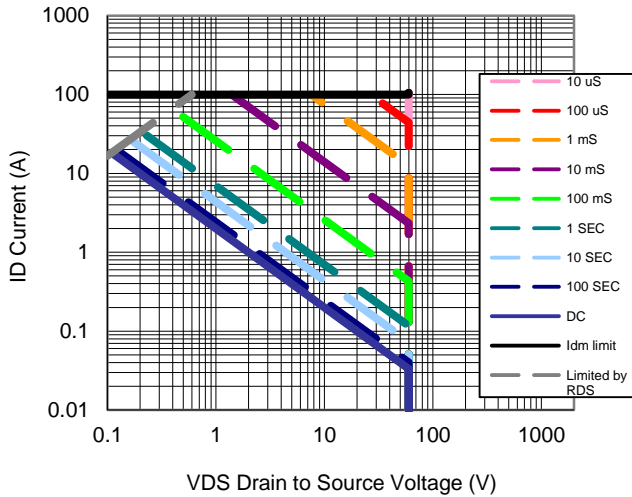


7. Gate Charge

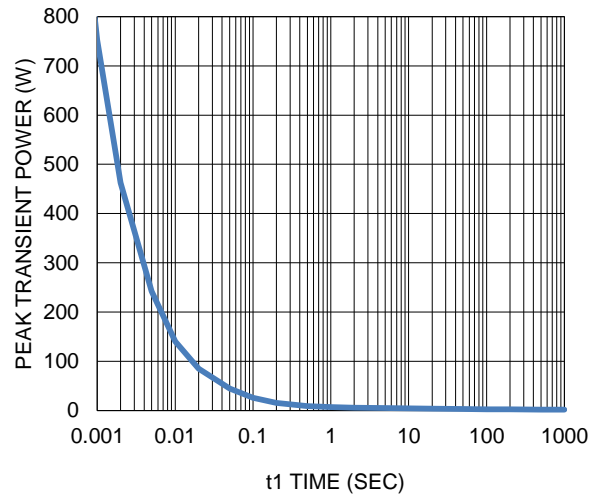


8. Normalized On-Resistance Vs Junction Temperature

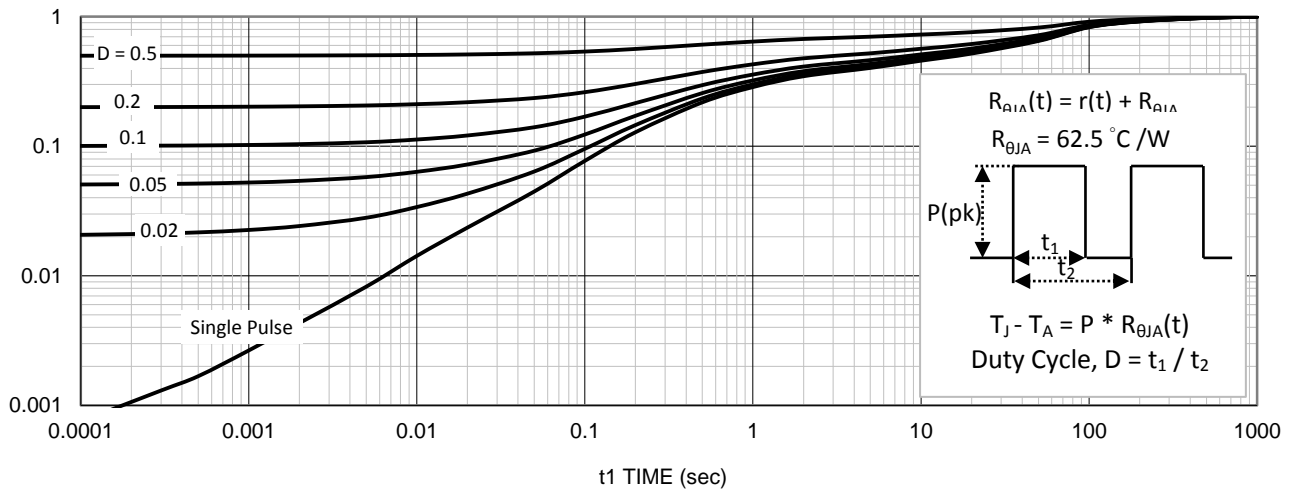
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9. Safe Operating Area

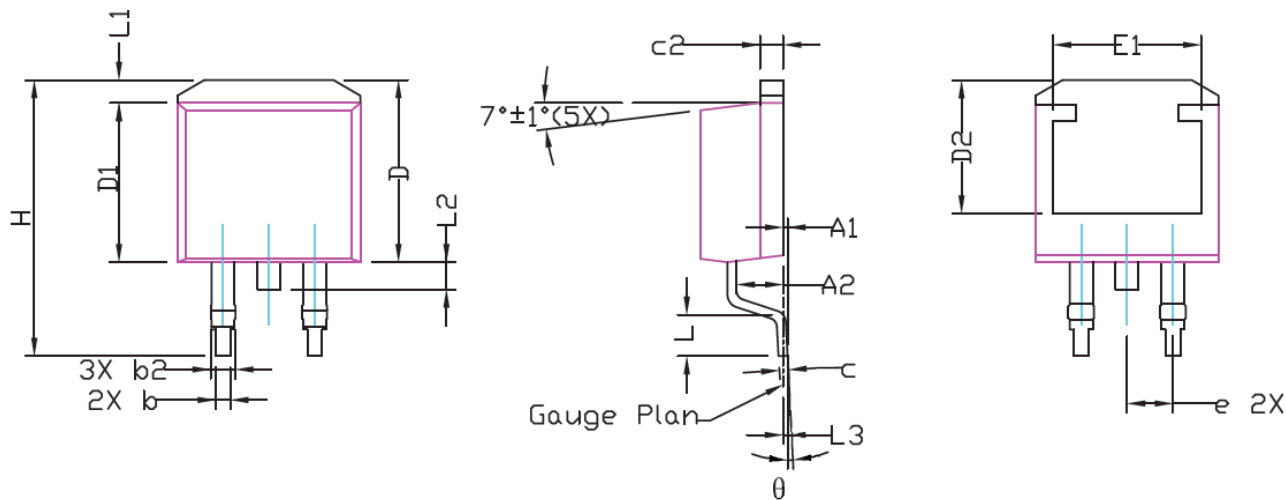


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MTN	NOM	MAX	MTN	NOM	MAX
A	4.30	4.57	4.72	0.169	0.180	0.186
A1	0	---	0.25	0	---	0.010
A2	2.47	2.57	2.67	0.097	0.101	0.105
b	0.69	0.813	0.94	0.027	0.032	0.037
b2	1.17	1.27	1.45	0.046	0.050	0.057
c	0.48	0.50	0.60	0.019	0.020	0.024
c2	1.17	1.27	1.37	0.046	0.050	0.054
D	9.80	10.05	10.30	0.386	0.396	0.406
D1	8.64	8.78	9.65	0.340	0.346	0.380
D2	7.12	7.37	7.62	0.280	0.290	0.300
E	9.70	10.15	10.54	0.382	0.400	0.415
E1	8.00	8.20	8.40	0.315	0.323	0.331
e	2.54 BSC			0.100 BSC		
H	14.99	15.24	15.49	0.590	0.600	0.610
L	1.78	2.29	2.79	0.070	0.090	0.110
L1	1.02	1.27	1.52	0.040	0.050	0.060
L2	---	---	1.75	---	---	0.069
L3	---	0.254	---	---	0.010	---
θ	0°	---	8°	0°	---	8°