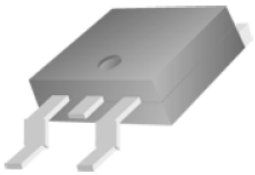
P-Channel 60-V (D-S) MOSFET

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

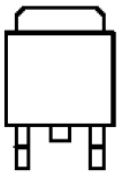
Typical Applications:
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

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

Pb-free
RoHS COMPLIANT
HALOGEN FREE



TO-263



Top View

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Units**
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [a]	T_A=25°C	I_D	-90	A
Pulsed Drain Current [b]		I_{DM}	-390	
Continuous Source Current (Diode Conduction) [a]		I_S	-110	A
Power Dissipation [a]	T_A=25°C	P_D	300	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient [a]	$R_{\theta JA}$	62.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

Notes

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 uA	-1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±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°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	mΩ
		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
Dynamic						
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 Ω, I_D = -20 A, V_{GEN} = -10 V, R_{GEN} = 6 Ω		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

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

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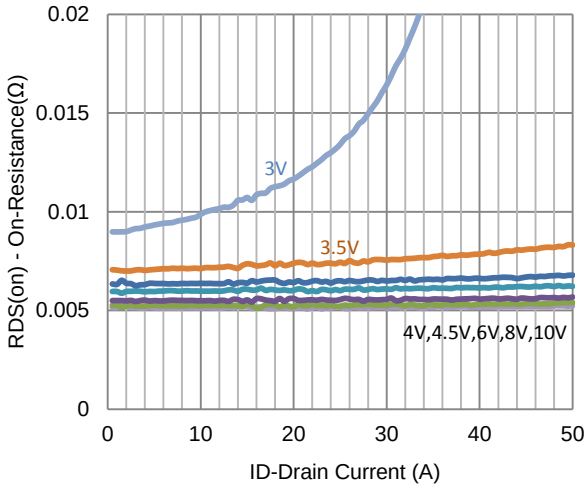
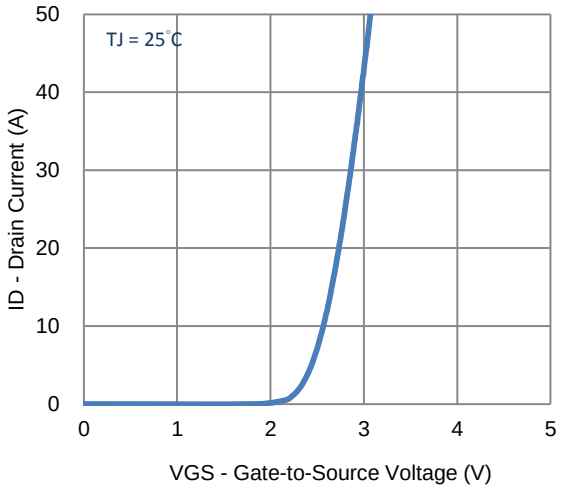
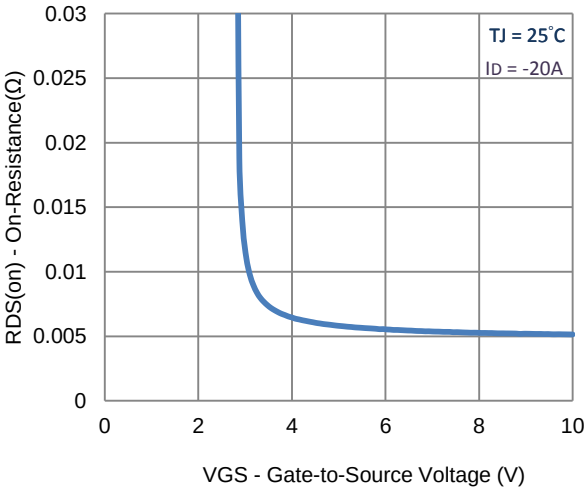
Typical Electrical Characteristics



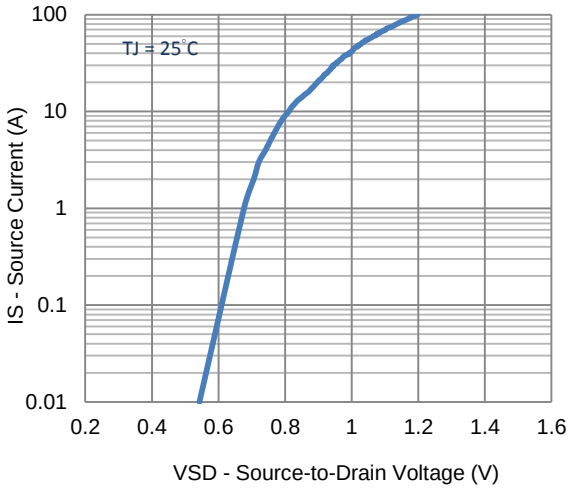
1. On-Resistance vs. Drain Current



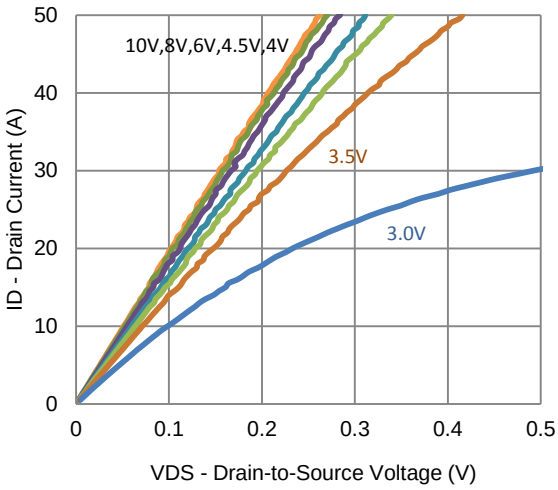
2. Transfer Characteristics



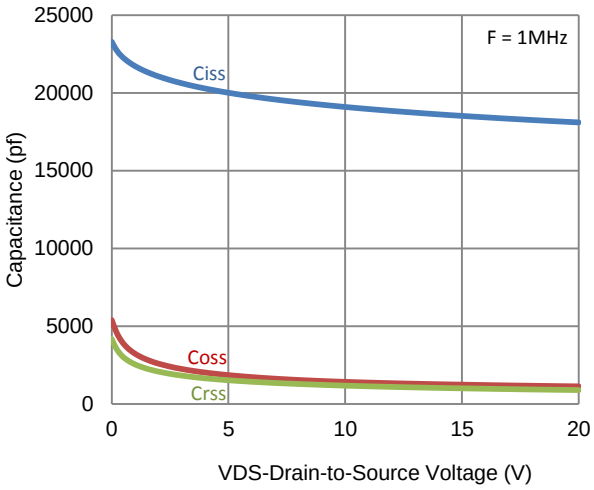
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

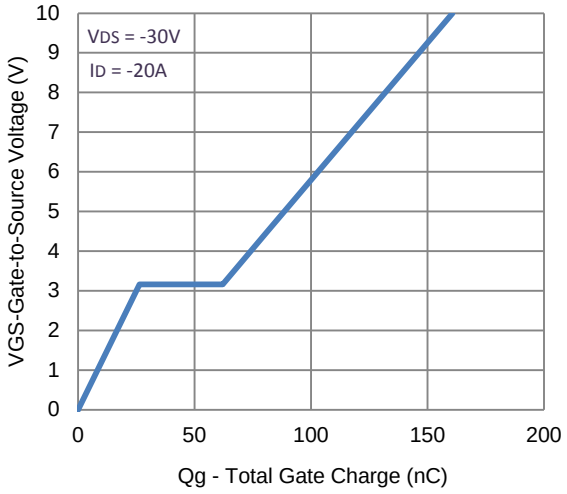


5. Output Characteristics

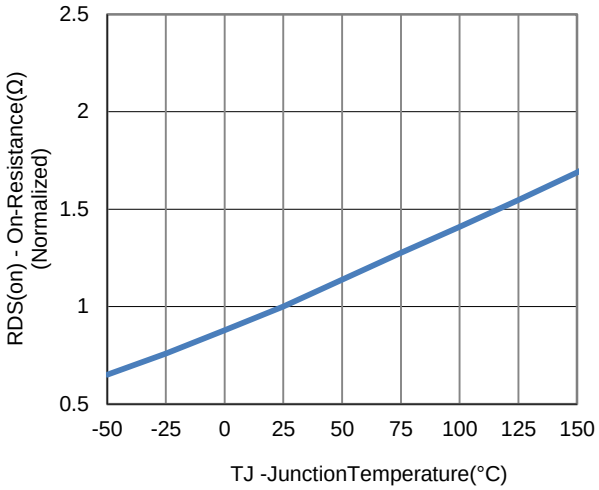


6. Capacitance

Typical Electrical Characteristics

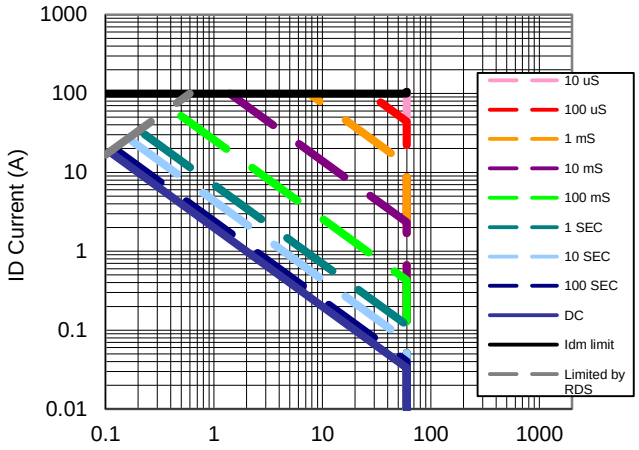


7. Gate Charge

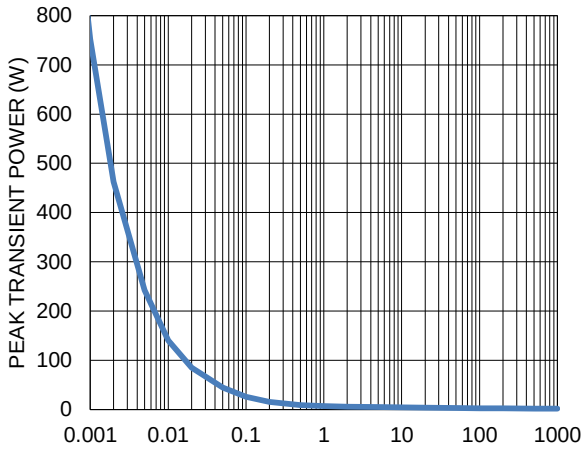


8. Normalized On-Resistance Vs Junction Temperature

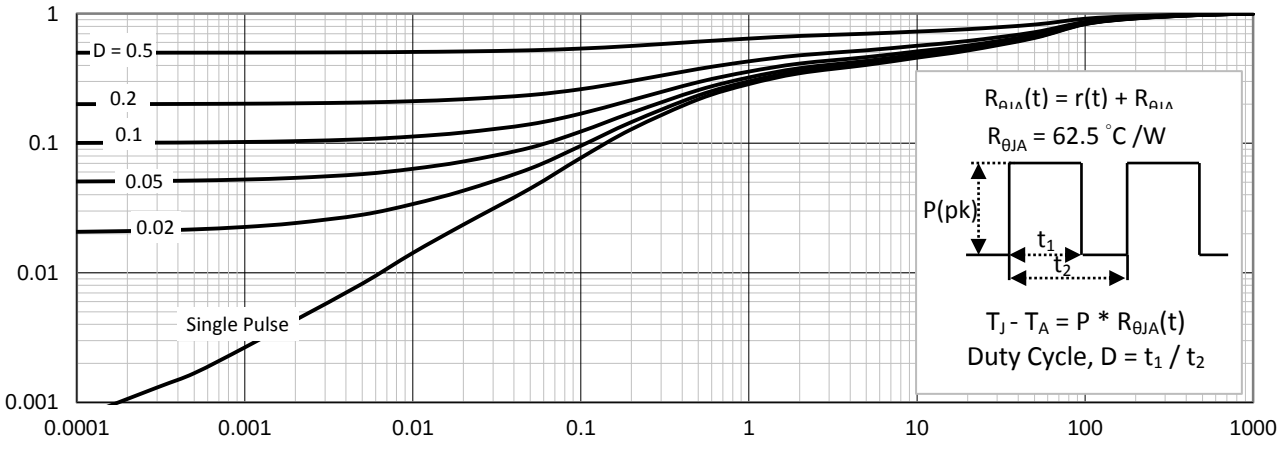
ID = 2.3A



9. Safe Operating Area

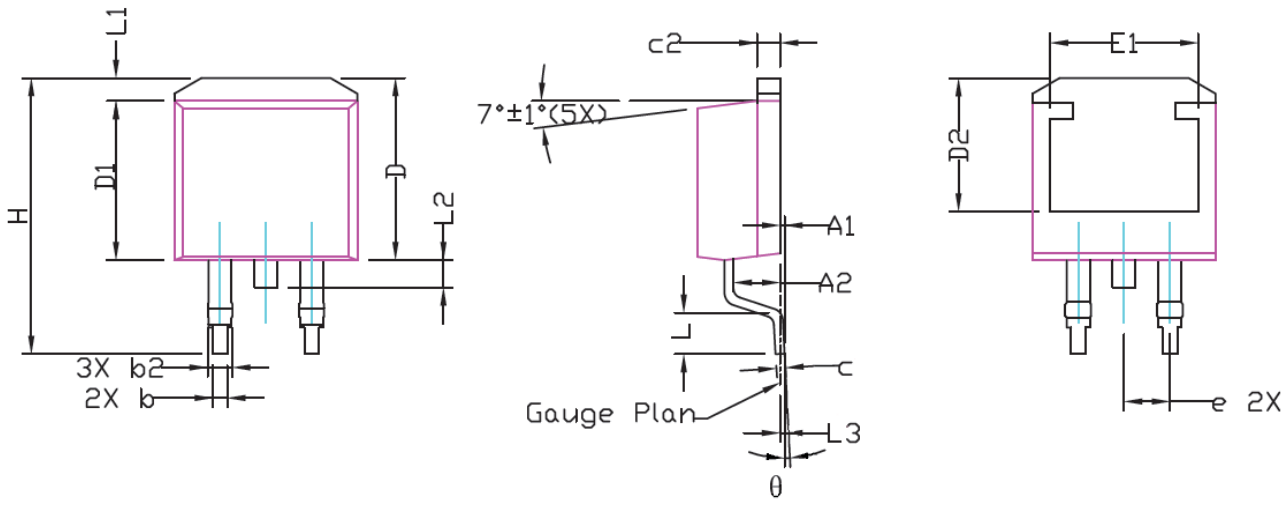


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	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°