N-Channel 75-V (D-S) MOSFET

Key Features:
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
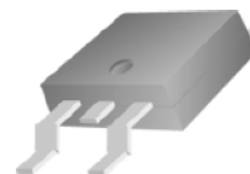
Typical Applications:
- White LED boost converters
- Automotive Systems
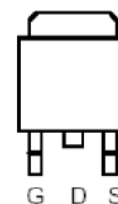- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
75	4.5 @ V_{GS} = 10V	230[a]
	5.5 @ V_{GS} = 4.5V	

RoHS COMPLIANT
HALOGEN FREE

TO-263

G D S
Top View

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	75	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [a]	T_C=25°C	I_D	230	A
Pulsed Drain Current [b]		I_{DM}	900	
Continuous Source Current (Diode Conduction) [a]	T_C=25°C	I_S	140	A
Power Dissipation [a]	T_C=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 [c]	$R_{\theta JA}$	62.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

Notes
a. Package Limited
b. Pulse width limited by maximum junction temperature
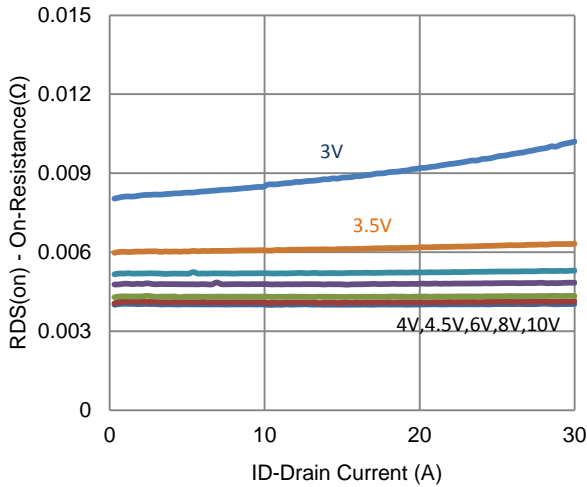c. Surface Mounted on 1" x 1" FR4 Board.

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, $V_{GS} = \pm20$ V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 56$ V, $V_{GS} = 0$ V			1	uA
		$V_{DS} = 56$ V, $V_{GS} = 0$ V, $T_J = 55°C$			10	
On-State Drain Current [a]	$I_{D(on)}$	$V_{DS} = 5$ V, $V_{GS} = 10$ V	50			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 40$ A			4.5	mΩ
		$V_{GS} = 4.5$ V, $I_D = 30$ A			5.5	
Forward Transconductance [a]	g_{fs}	$V_{DS} = 15$ V, $I_D = 20$ A		21		S
Diode Forward Voltage [a]	V_{SD}	$I_S = 70$ A, $V_{GS} = 0$ V		1		V
Dynamic [b]						
Total Gate Charge	Q_g	$V_{DS} = 37.5$ V, $V_{GS} = 4.5$ V, $I_D = 20$ A		78		nC
Gate-Source Charge	Q_{gs}			23		
Gate-Drain Charge	Q_{gd}			28		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 37.5$ V, $R_L = 1.8$ Ω, $I_D = 20$ A, $V_{GEN} = 10$ V, $R_{GEN} = 6$ Ω		25		ns
Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(off)}$			210		
Fall Time	t_f			61		
Input Capacitance	C_{iss}	$V_{DS} = 15$ V, $V_{GS} = 0$ V, f = 1 Mhz		9101		pF
Output Capacitance	C_{oss}			518		
Reverse Transfer Capacitance	C_{rss}			407		

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.
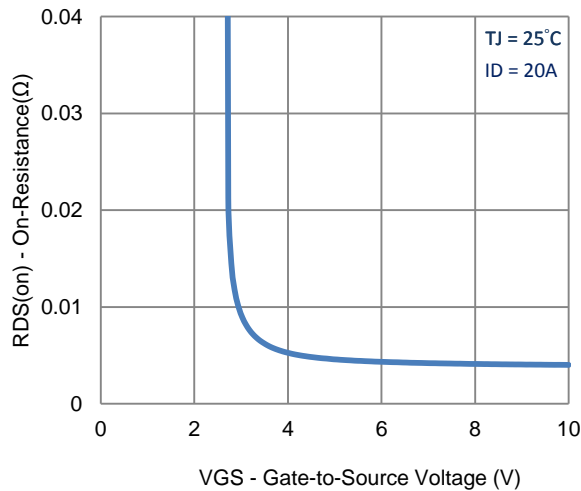b. Guaranteed by design, not subject to production testing.

Typical Electrical Characteristics
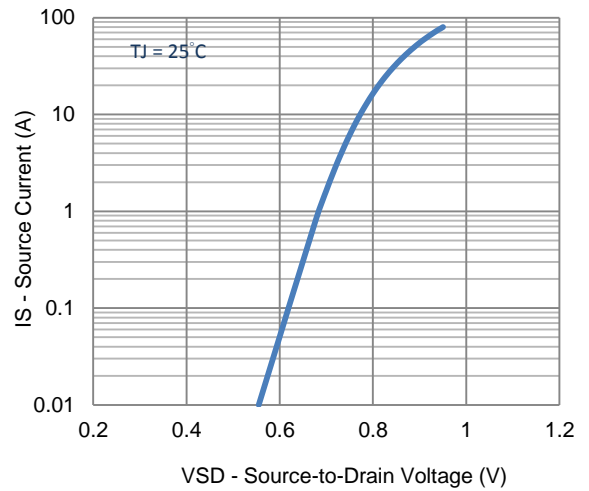

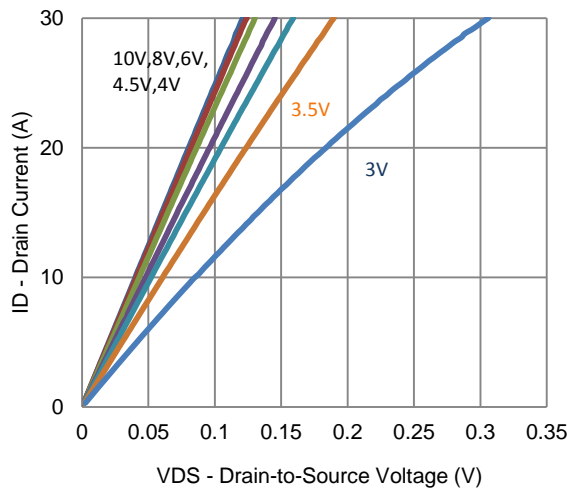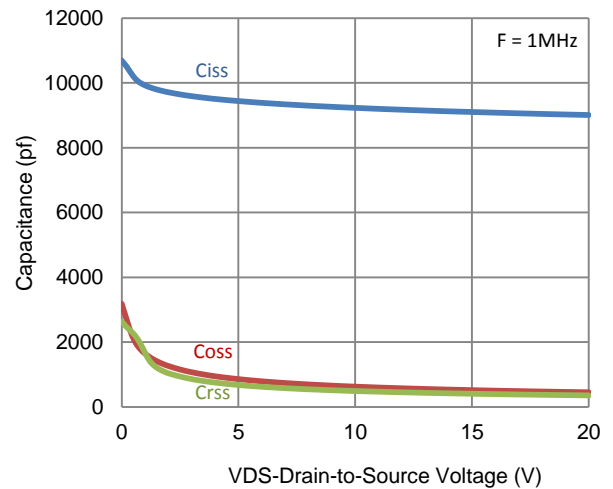**1. On-Resistance vs. Drain Current**
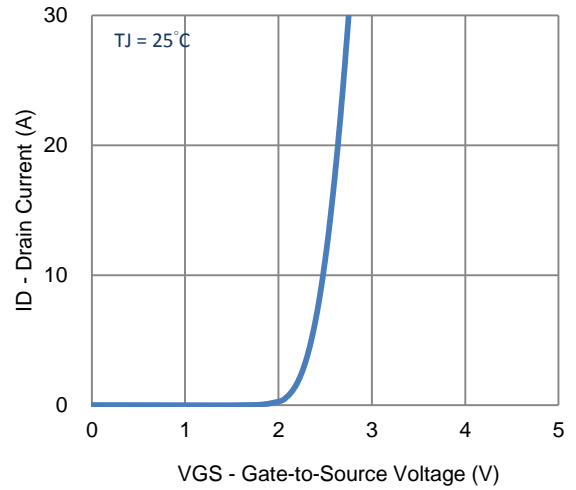
2. Transfer Characteristics

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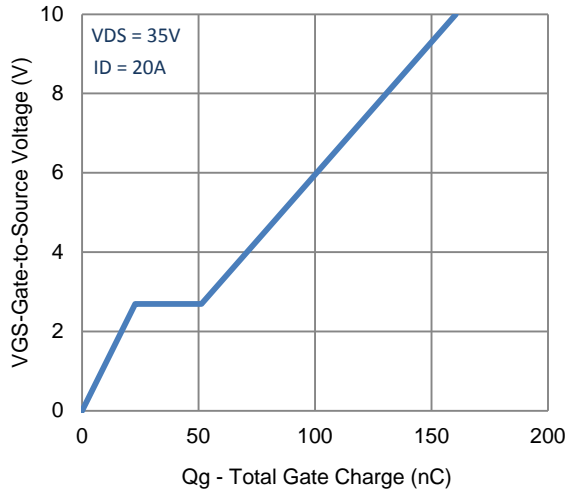

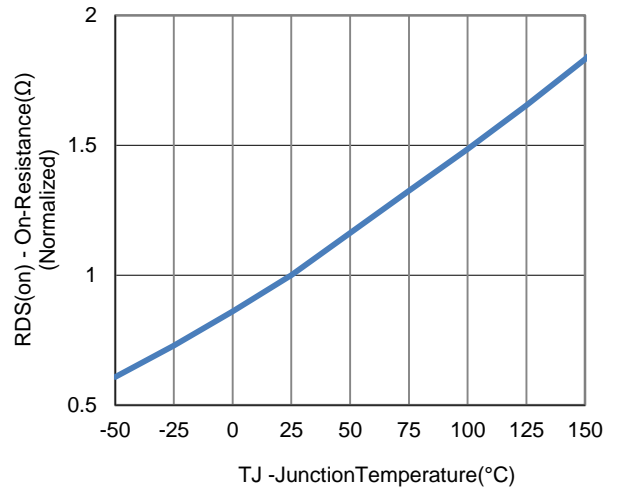**4. Drain-to-Source Forward Voltage**

5. Output Characteristics

6. Capacitance

Typical Electrical Characteristics

7. Gate Charge

VDS = 35V
ID = 20A

8. Normalized On-Resistance Vs Junction Temperature

9. Safe Operating Area

Legend:
- 10 uS
- 100 uS
- 1 mS
- 10 mS
- 100 mS
- 1 SEC
- 10 SEC
- 100 SEC
- DC
- Idm limit
- Limited by RDS
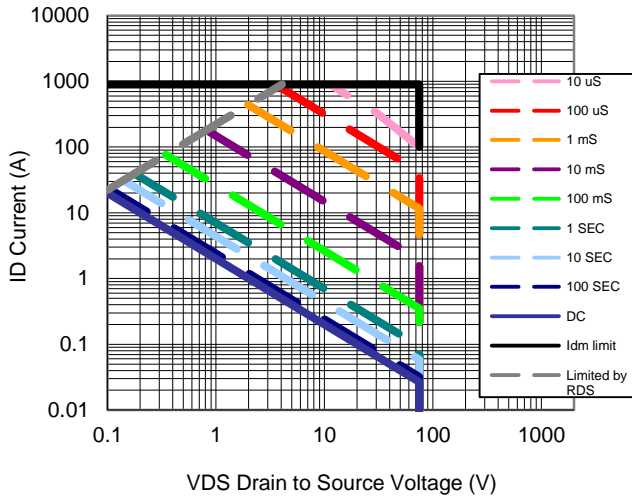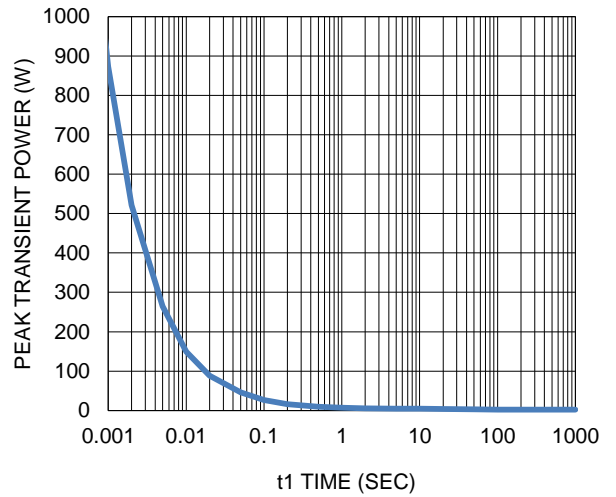
10. Single Pulse Maximum Power Dissipation

$R_{\theta JA}(t) = r(t) + R_{\theta JA}$

$R_{\theta JA} = 62.5\ ^\circ C/W$

$T_J - T_A = P * R_{\theta JA}(t)$

Duty Cycle, $D = t_1 / t_2$
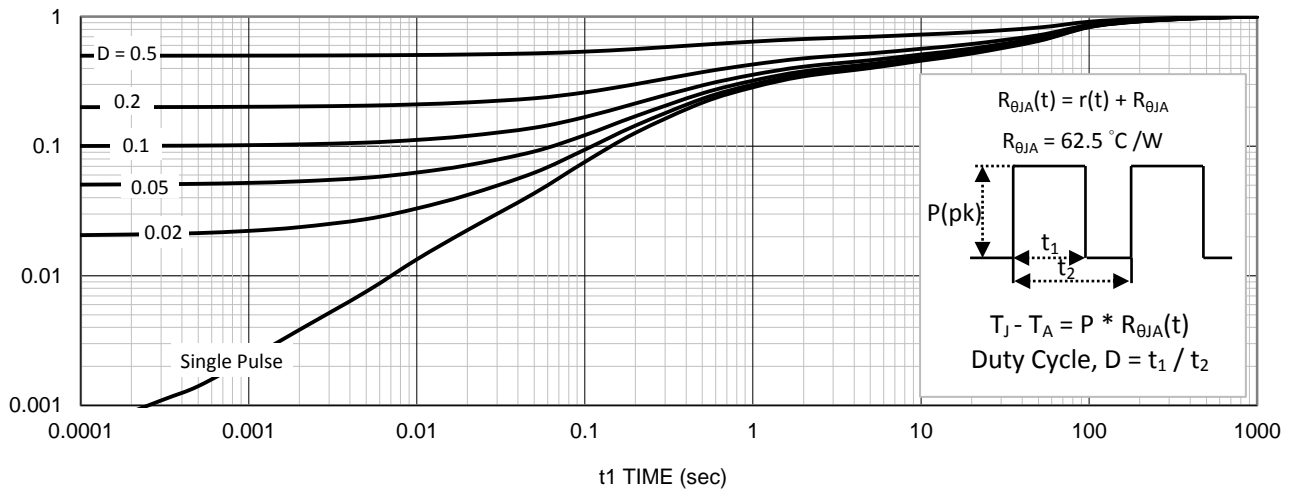
11. Normalized Thermal Transient Junction to Ambient

Package Information
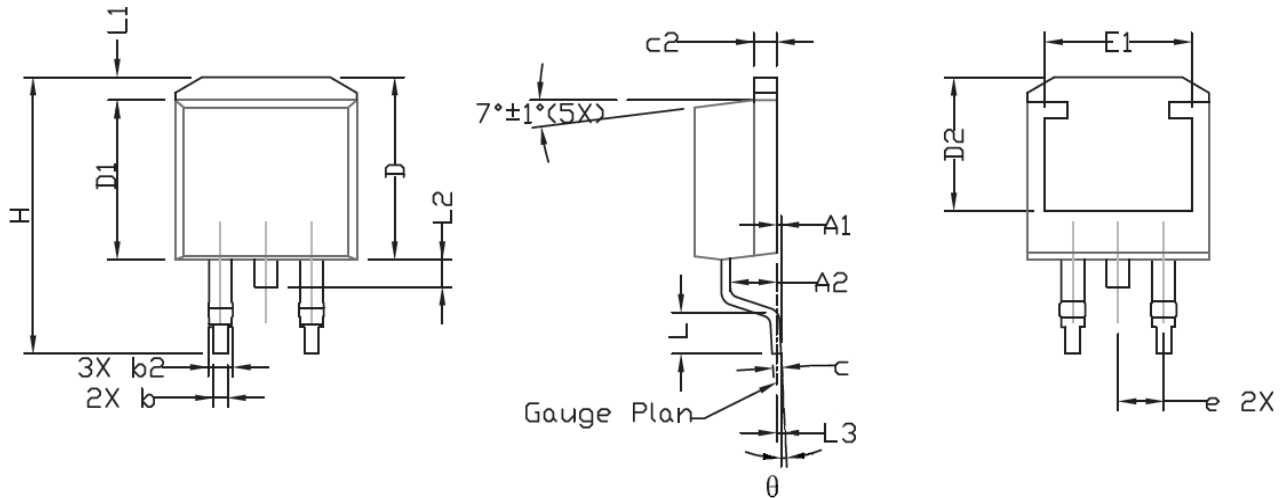
SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.57	4.72	0.169	0.180	0.186
A1	0	---	0.25	0	---	0.010
A2	2.47	2.57	2.67	0.097	0.101	0.105
b	0.69	0.813	0.94	0.027	0.032	0.037
b2	1.17	1.27	1.45	0.046	0.050	0.057
c	0.48	0.50	0.60	0.019	0.020	0.024
c2	1.17	1.27	1.37	0.046	0.050	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°