

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

### Key Features:

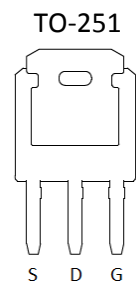
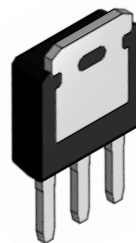
- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

### Typical Applications:

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



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**



PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
-60	175 @ $V_{GS} = -10V$	-14
	200 @ $V_{GS} = -4.5V$	-13

### 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>	$I_D$	-14	A
Pulsed Drain Current <sup>b</sup>		-50	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	-20	A
Power Dissipation <sup>a</sup>	$P_D$	50	W
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{\theta JC}$	3	

### Notes

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

## Electrical Characteristics

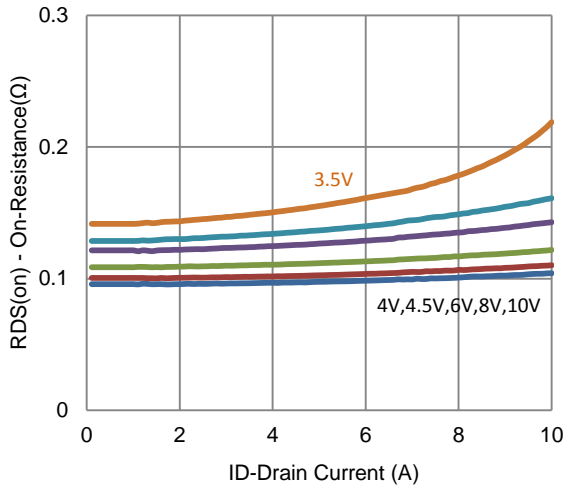
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -48 V, V_{GS} = 0 V$			-1	uA
		$V_{DS} = -48 V, V_{GS} = 0 V, T_J = 55^\circ C$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -10 V$	-20			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 V, I_D = -10 A$			175	m $\Omega$
		$V_{GS} = -4.5 V, I_D = -8 A$			200	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15 V, I_D = -10 A$		7		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -10 A, V_{GS} = 0 V$		-0.75		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -30 V, V_{GS} = -4.5 V,$ $I_D = -10 A$		9		nC
Gate-Source Charge	$Q_{gs}$			2.6		
Gate-Drain Charge	$Q_{gd}$			4.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -30 V, R_L = 3 \Omega,$ $I_D = -10 A,$ $V_{GEN} = -10 V, R_{GEN} = 6 \Omega$		4		ns
Rise Time	$t_r$			4		
Turn-Off Delay Time	$t_{d(off)}$			23		
Fall Time	$t_f$			10		
Input Capacitance	$C_{iss}$	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 Mhz$		528		pF
Output Capacitance	$C_{oss}$			65		
Reverse Transfer Capacitance	$C_{rss}$			45		

## Notes

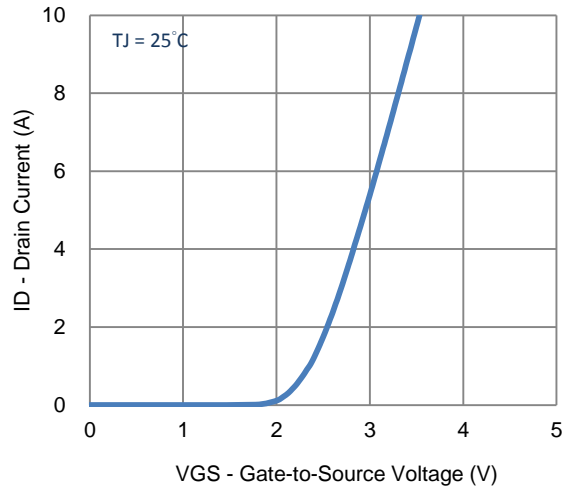
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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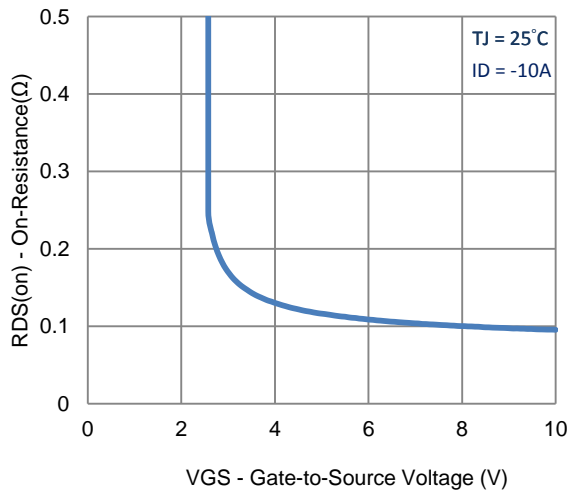
Typical Electrical Characteristics



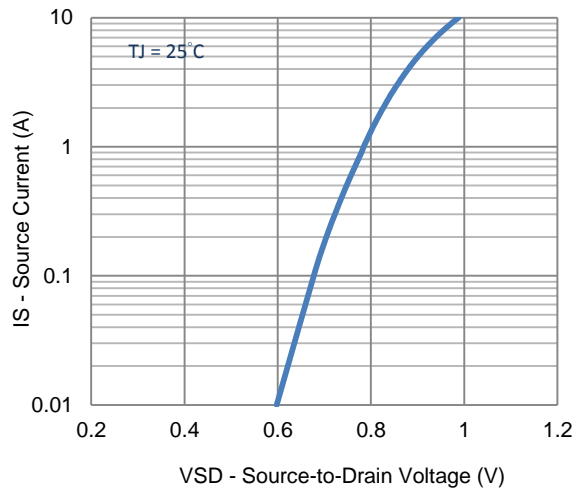
1. On-Resistance vs. Drain Current



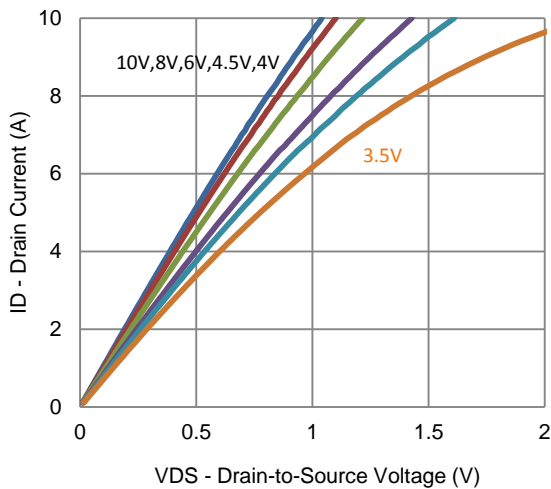
2. Transfer Characteristics



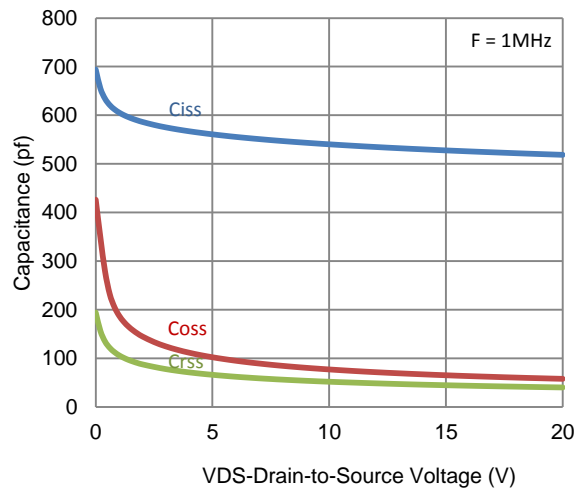
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

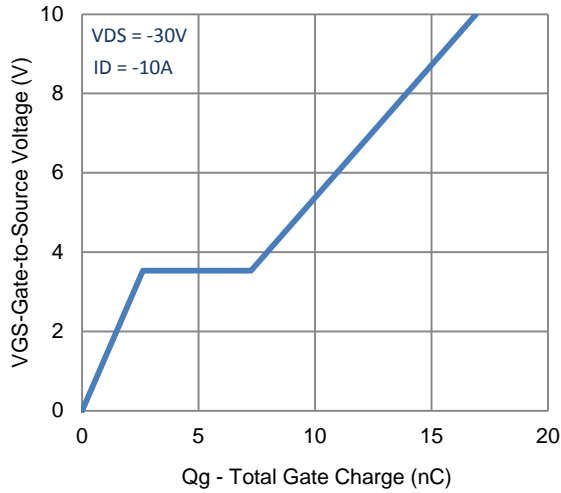


5. Output Characteristics

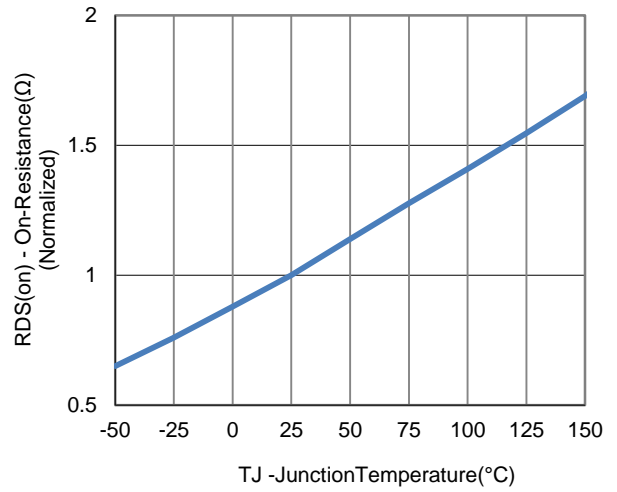


6. Capacitance

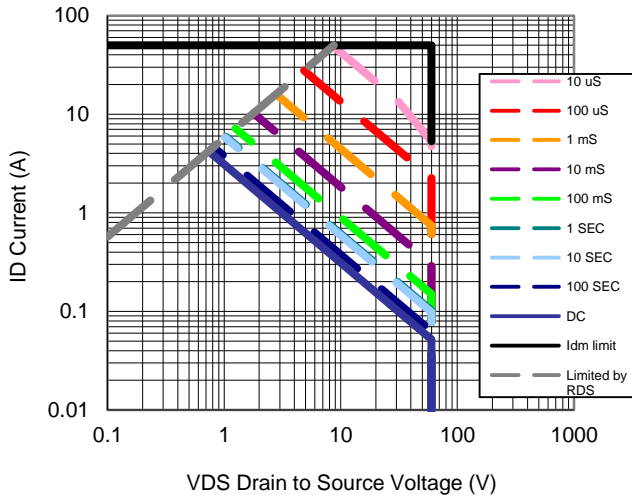
Typical Electrical Characteristics



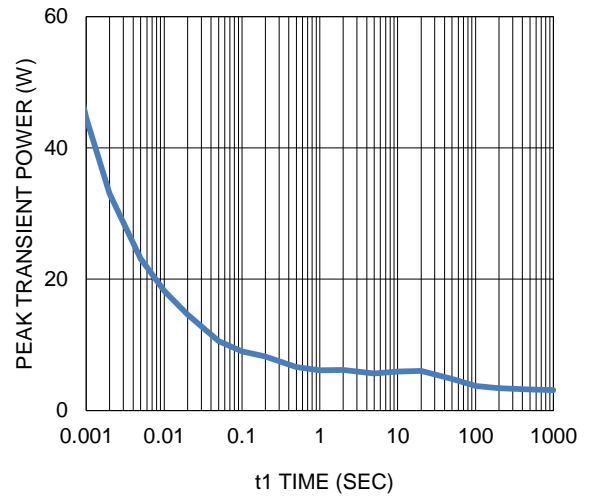
7. Gate Charge



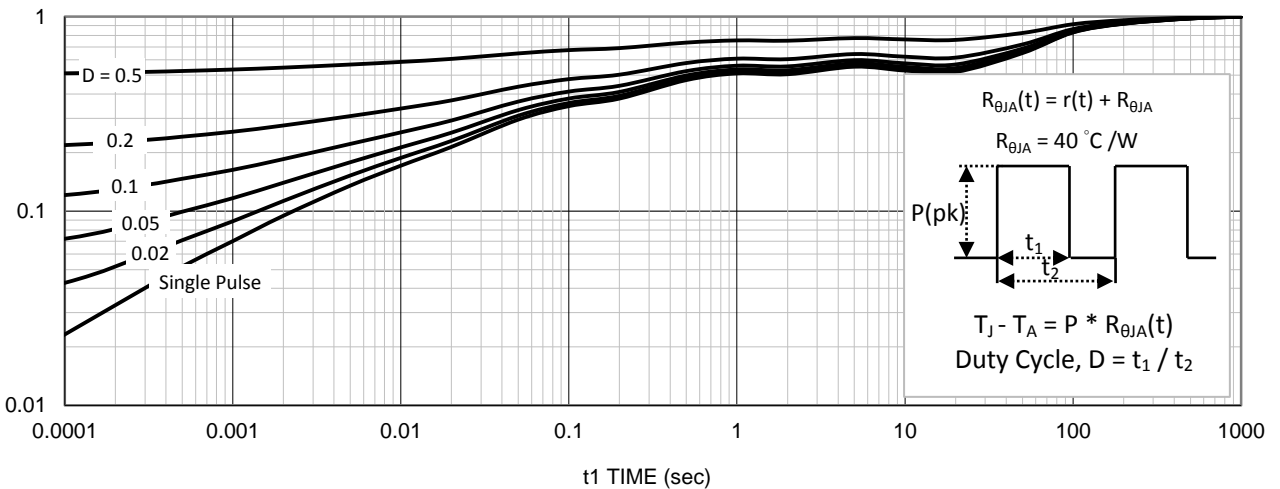
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

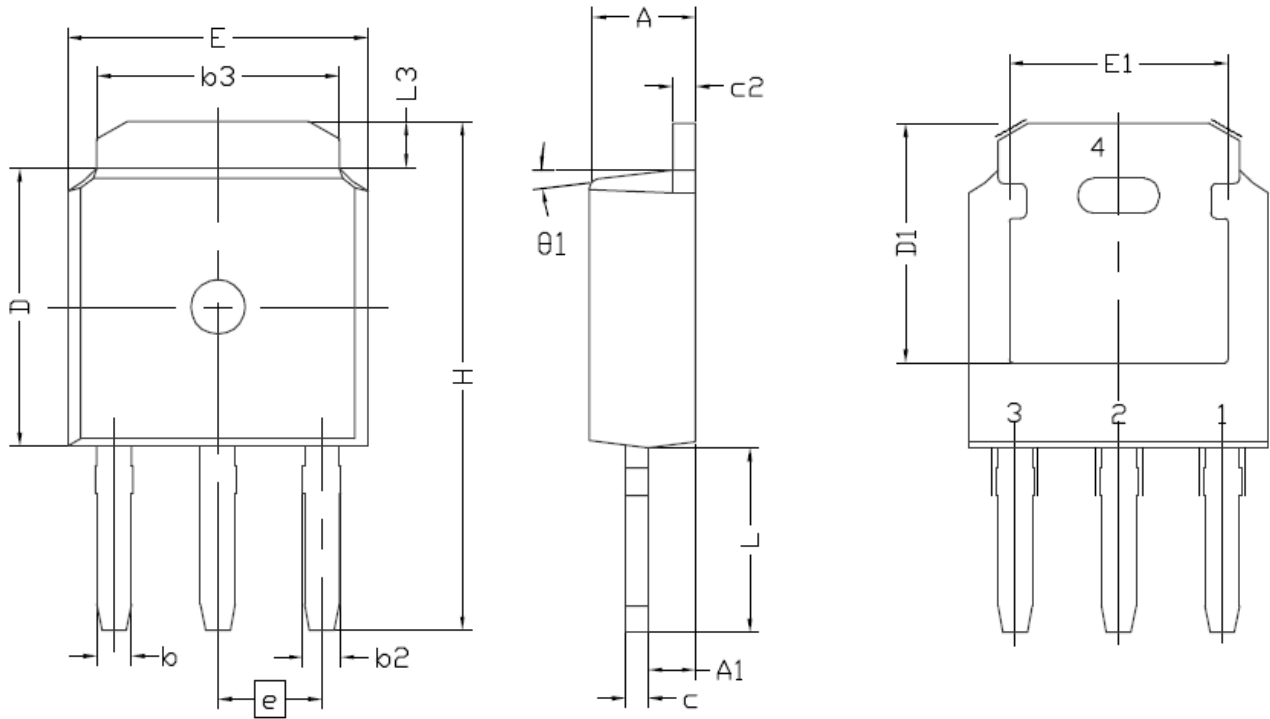


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
E	6.35	6.60	6.73	0.250	0.260	0.265
L	3.70	4.05	4.40	0.146	0.159	0.173
L3	0.89	1.016	1.27	0.035	0.040	0.050
D	6.00	6.10	6.20	0.236	0.240	0.244
H	10.80	11.15	11.50	0.425	0.439	0.453
b	0.635	0.76	0.889	0.025	0.030	0.035
b2	0.762	0.84	1.143	0.030	0.033	0.045
b3	5.21	5.34	5.46	0.205	0.210	0.215
e	2.286 BSC			0.090 BSC		
A	2.20	2.30	2.38	0.087	0.091	0.094
A1	0.94	1.04	1.14	0.037	0.041	0.045
c	0.457	0.50	0.60	0.018	0.020	0.024
c2	0.457	0.50	0.60	0.018	0.020	0.024
D1	5.21	--	--	0.205	--	--
E1	4.318	--	--	0.170	--	--
$\theta1$	0°	7°	15°	0°	7°	15°