

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

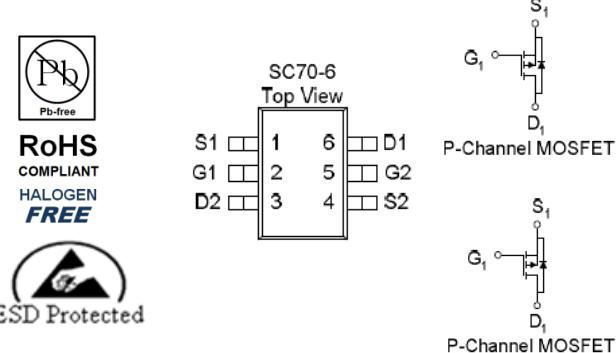
### Key Features:

- 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	1250 @ $V_{GS} = -10V$	-0.400
	1700 @ $V_{GS} = -4.5V$	-0.343



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ 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>	$T_A = 25^\circ C$	$I_D$	-0.400	A
	$T_A = 70^\circ C$		-0.335	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	-2	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	-0.4	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	0.3	W
	$T_A = 70^\circ C$		0.21	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	415	°C/W
	Steady State		460	

### Notes

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

## Electrical Characteristics

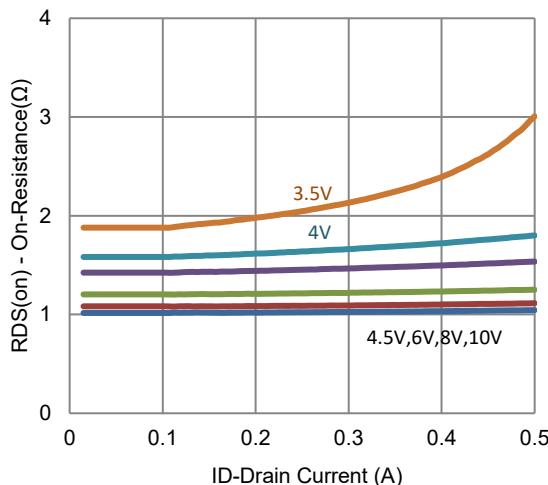
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = -250 \mu A$	-1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 V$ , $V_{GS} = \pm 20 V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -48 V$ , $V_{GS} = 0 V$			-1	$\mu A$
		$V_{DS} = -48 V$ , $V_{GS} = 0 V$ , $T_J = 55^\circ C$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} = -5 V$ , $V_{GS} = -10 V$	-0.6			A
Drain-Source On-Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 V$ , $I_D = -0.4 A$			1250	$m\Omega$
		$V_{GS} = -4.5 V$ , $I_D = -0.3 A$			1700	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -30 V$ , $I_D = -0.4 A$		0.64		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -0.2 A$ , $V_{GS} = 0 V$		-0.81		V
<b>Dynamic <sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -30 V$ , $V_{GS} = -4.5 V$ , $I_D = -0.1 A$		1.197		nC
Gate-Source Charge	$Q_{gs}$			0.343		
Gate-Drain Charge	$Q_{gd}$			0.464		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -30 V$ , $R_L = 300 \Omega$ , $I_D = -0.1 A$ , $V_{GEN} = -10 V$ , $R_{GEN} = 6 \Omega$		6		ns
Rise Time	$t_r$			3		
Turn-Off Delay Time	$t_{d(off)}$			9		
Fall Time	$t_f$			6		
Input Capacitance	$C_{iss}$	$V_{DS} = -30 V$ , $V_{GS} = 0 V$ , $f = 1 \text{ Mhz}$		56		pF
Output Capacitance	$C_{oss}$			8		
Reverse Transfer Capacitance	$C_{rss}$			6		

## Notes

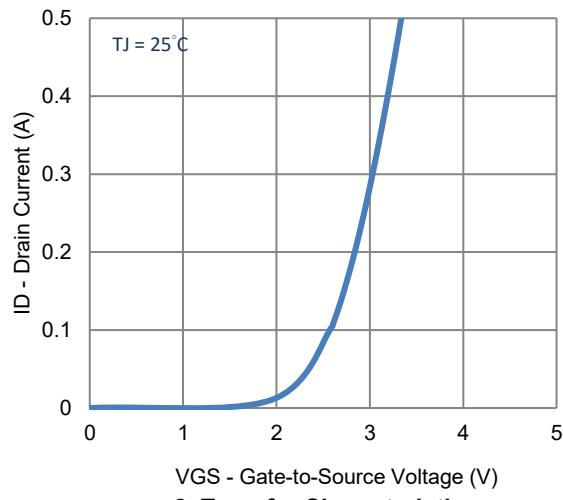
- a. Pulse test: PW <= 300us duty cycle <= 2%.
- b. Guaranteed by design, not subject to production testing.

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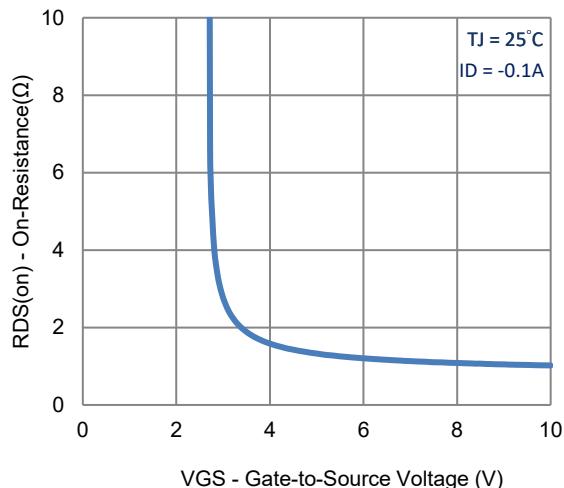
## Typical Electrical Characteristics



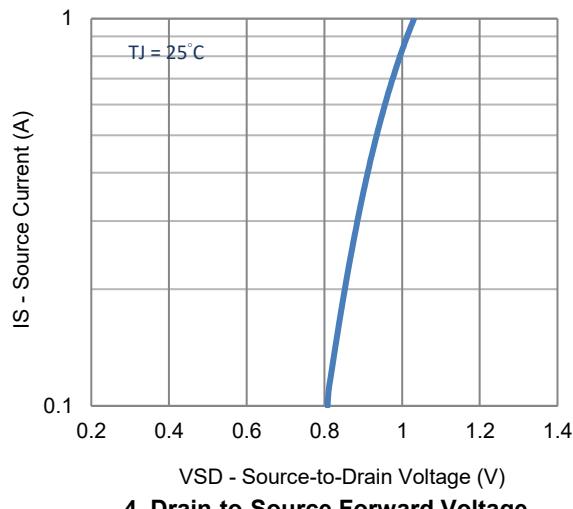
1. On-Resistance vs. Drain Current



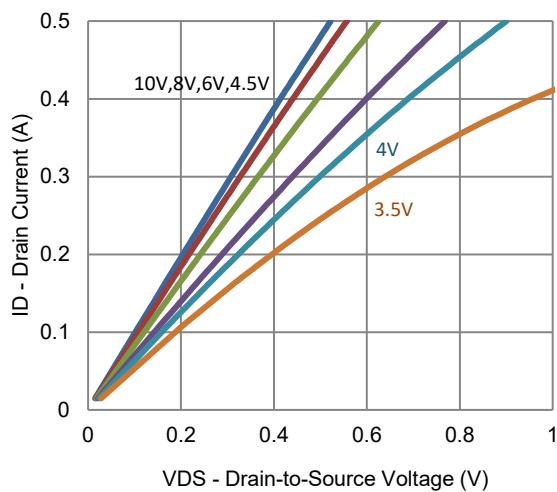
2. Transfer Characteristics



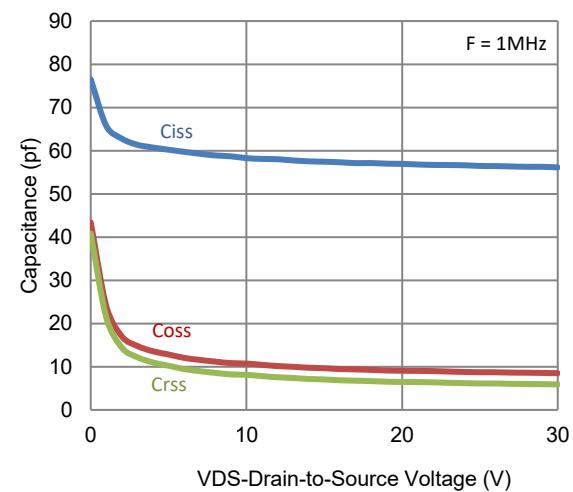
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

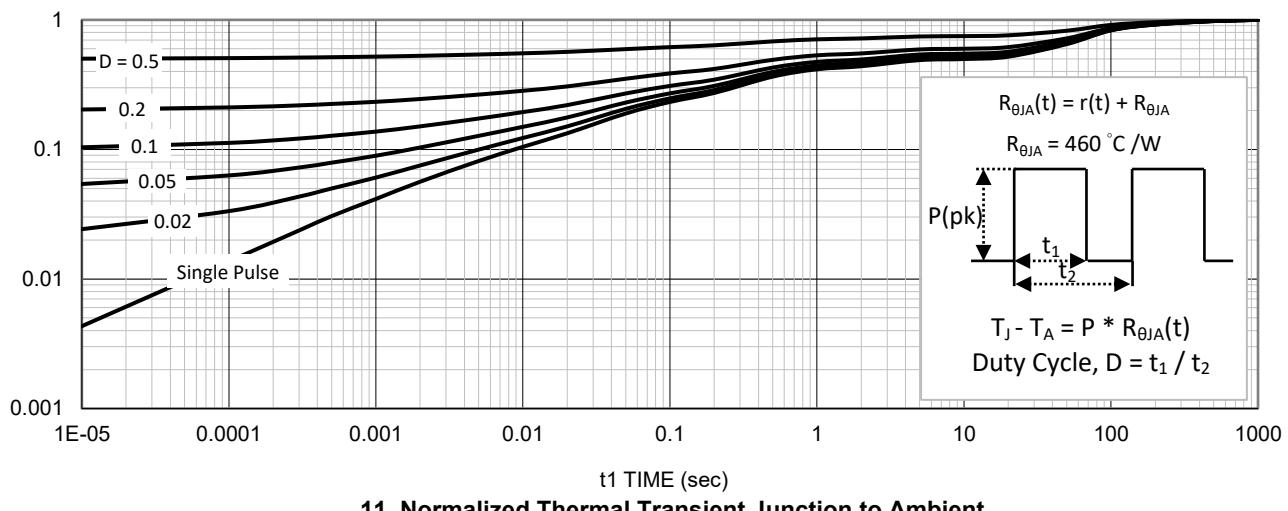
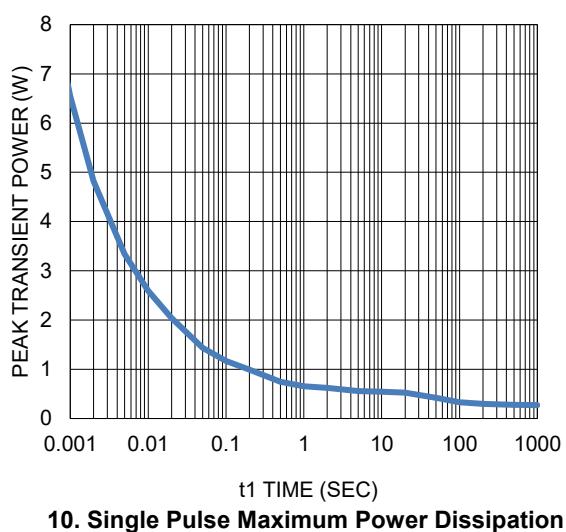
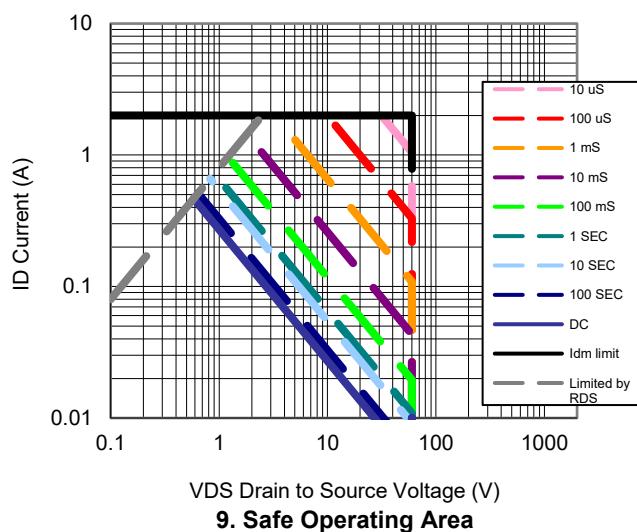
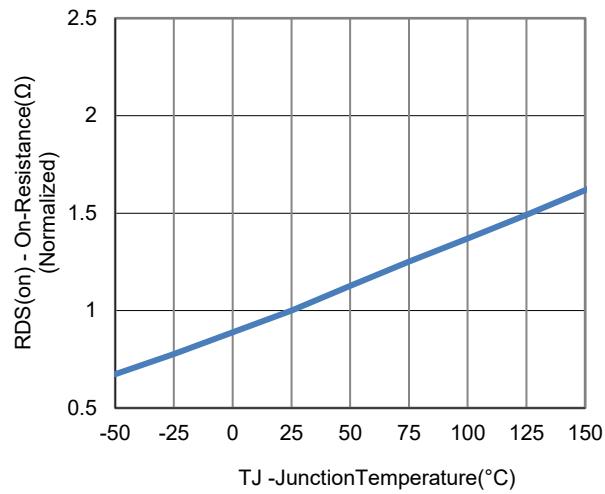
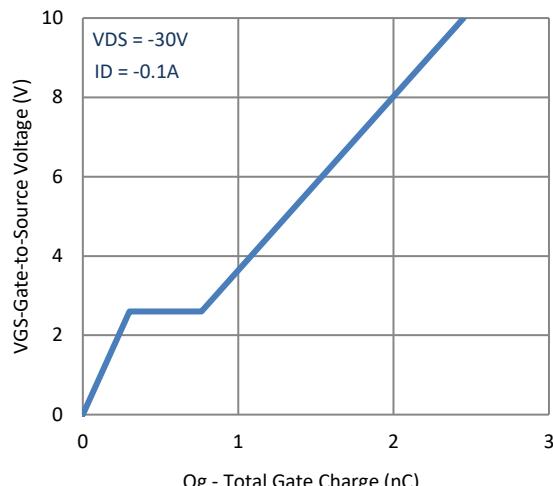


5. Output Characteristics

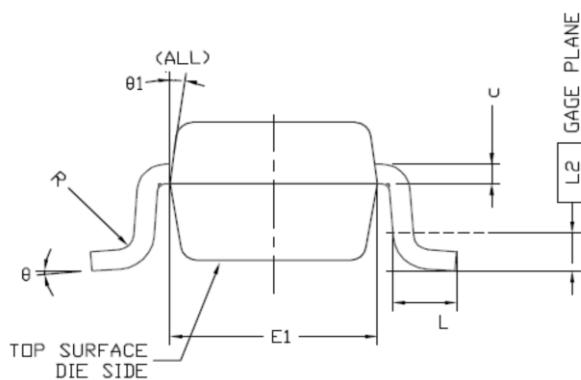
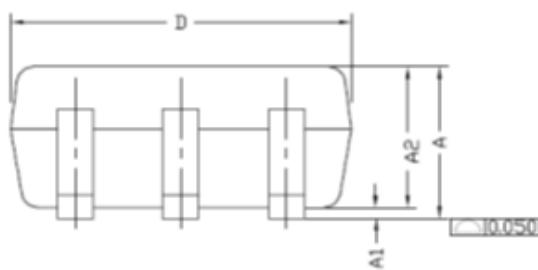
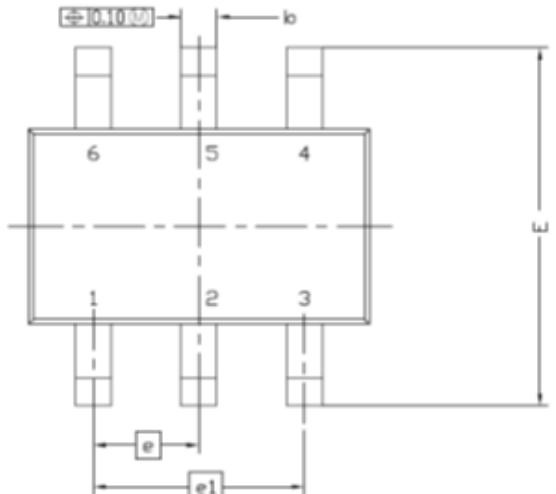


6. Capacitance

## Typical Electrical Characteristics



## Package Information



DIM.	MILLIMETERS	
	MIN	MAX
A	0.8	1.1
A1	0	0.1
A2	0.7	1
b	0.15	0.3
c	0.08	0.2
D	2	2.2
E	2	2.2
E1	1.15	1.35
e	0.65 BSC	
e1	1.3 BSC	
L	0.26	0.46
L2	0.1	0.3
R	0.1	---
θ	0°	8°
θ1	6°	11°

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