

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

Product summary		
$V_{DS}$	-60	V
$R_{DS(ON)}$ (at $V_{GS}=-10V$ ) Typ.	6.7	m $\Omega$
$I_D$ ( $T_C=25^\circ C$ )	-92	A

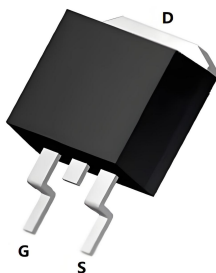
### Features

- Low Gate Charge
- Repetitive Avalanche Rated
- Fast Switching Characteristic

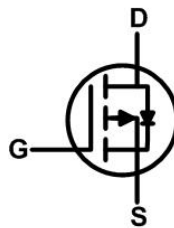
### Applications

- DC-DC Converters
- Power management functions

### Pin Configuration



TO-263



### Packing Information

Device	Marking	Reel Size	Tape Width	Quantity
ECFC92P06S	E5D0P06	13"	16mm	800pcs

### Absolute Maximum Ratings (at $T_A=25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-60	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$I_D$	Continuous Drain Current at $V_{GS}=-10V$	$T_C=25^\circ C$	-92
		$T_C=100^\circ C$	-58
$I_{DM}$	Pulse Drain Current Tested <sup>A</sup>	-312	A
$E_{AS}$	Single Pulse Avalanche Energy	800	mJ
$P_D$	Power Dissipation	125	W
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ C$

### Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient <sup>B</sup>	62	$^\circ C/W$

**Electrical Characteristics (at  $T_J = 25^\circ\text{C}$  Unless Otherwise Noted)**

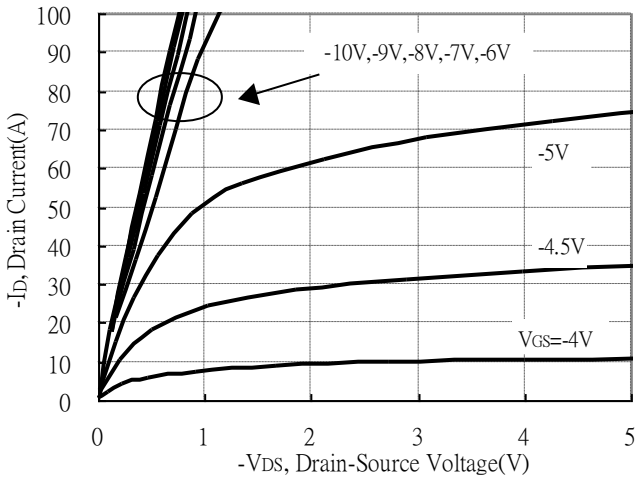
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-48V, V_{GS}=0V$	--	--	-1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 30V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	--	-4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-20A$	--	6.7	9	m $\Omega$
$V_{SD}$	Forward Voltage	$I_S=-20A, V_{GS}=0V$	--	--	-1.2	V
$I_S$	Maximum Body-Diode Continuous Current		--	--	-92	A
<b>Dynamic Parameters</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-30V$ $f=1\text{MHz}$	--	6717	--	pF
$C_{oss}$	Output Capacitance		--	756	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	347	--	pF
<b>Switching Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-30V, I_D=-20A$ $V_{GS}=-10V$	--	129	--	nC
$Q_{gs}$	Gate-Source Charge		--	21	--	nC
$Q_{gd}$	Gate-Drain Charge		--	42.6	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=-30V$ $I_D=-20A, R_{GEN}=1\Omega,$ $V_{GS}=-10V$	--	39.6	--	nS
$t_r$	Turn-on Rise Time		--	30.5	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	91.8	--	nS
$t_f$	Turn-off Fall Time		--	22.3	--	nS

A. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

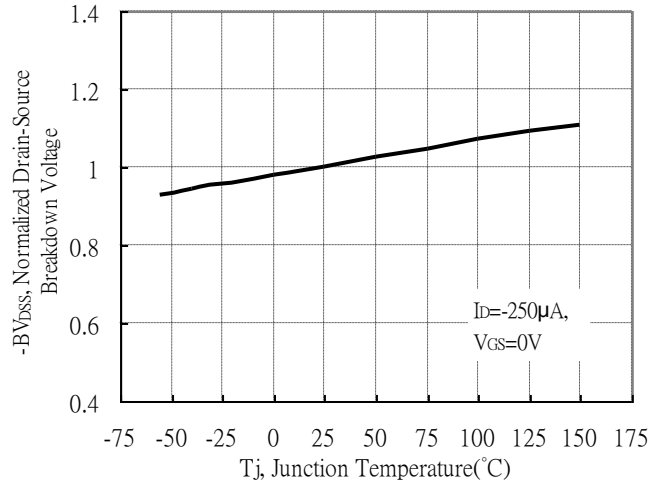
B.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design, while  $R_{\theta JA}$  is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper

**Typical Characteristics**

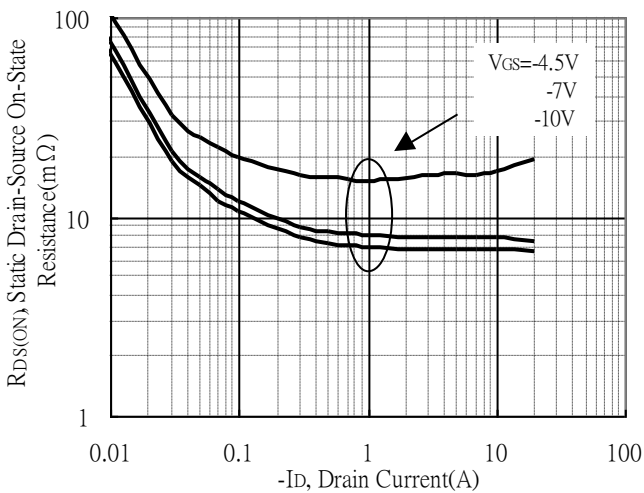
Typical Output Characteristics



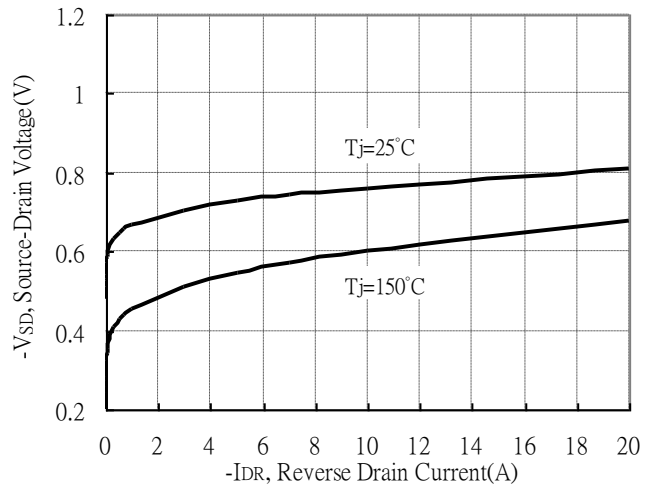
Brekdown Voltage vs Junction Temperature



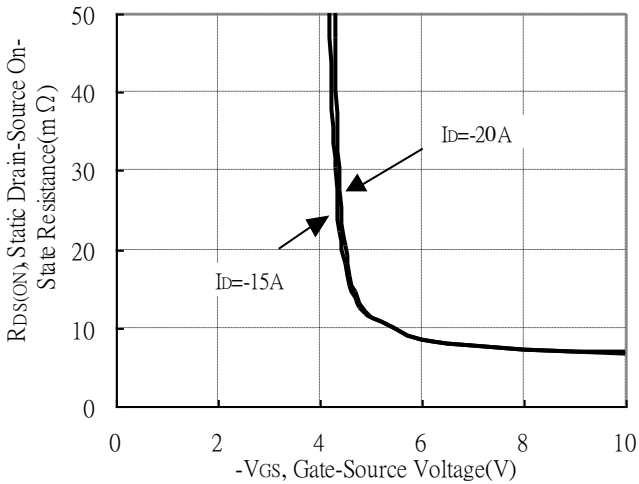
Static Drain-Source On-State resistance vs Drain Current



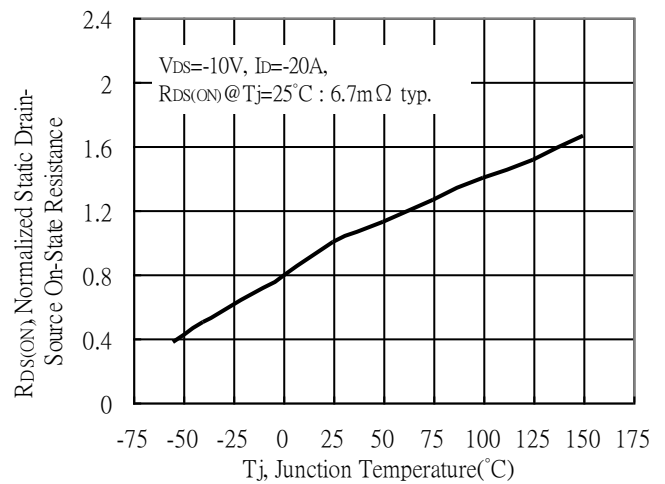
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

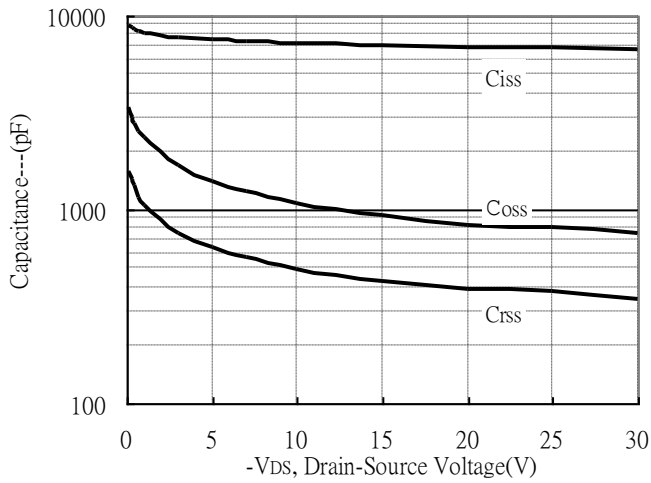


Drain-Source On-State Resistance vs Junction Temperature

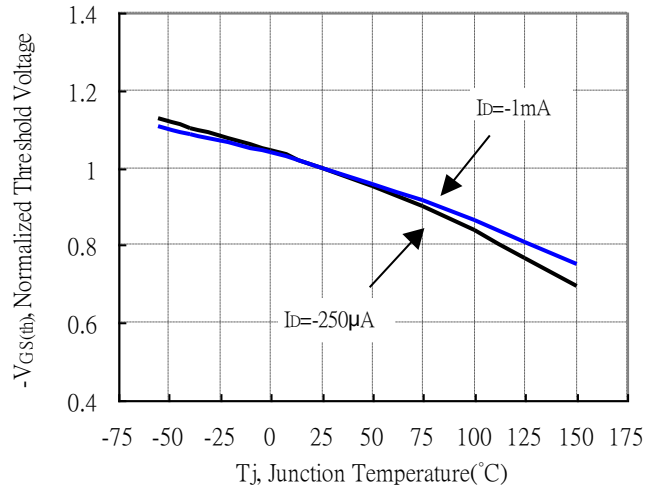


**Typical Characteristics**

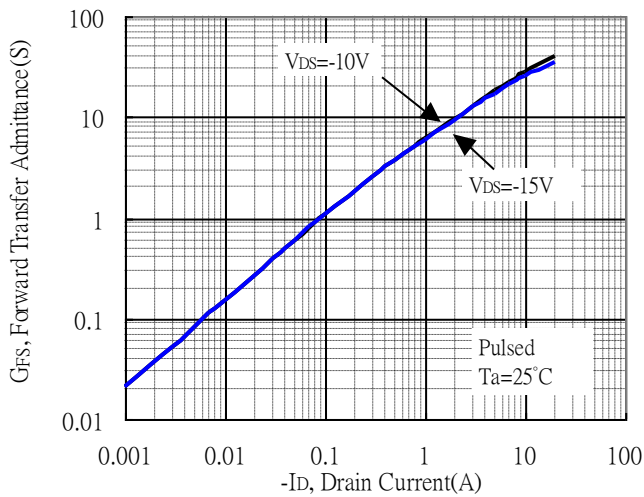
Capacitance vs Drain-to-Source Voltage



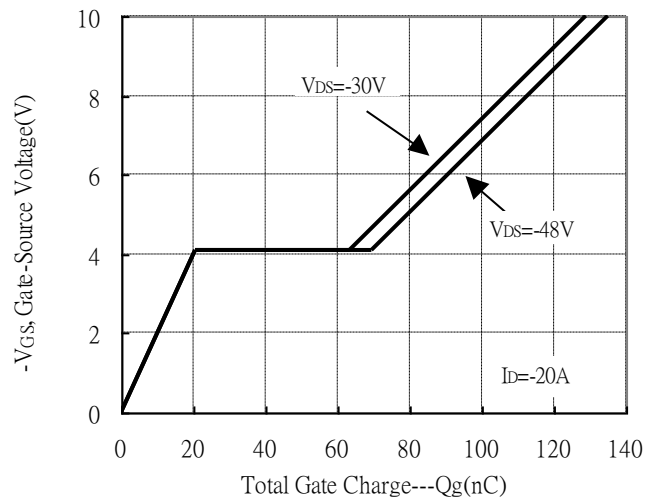
Threshold Voltage vs Junction Temperature



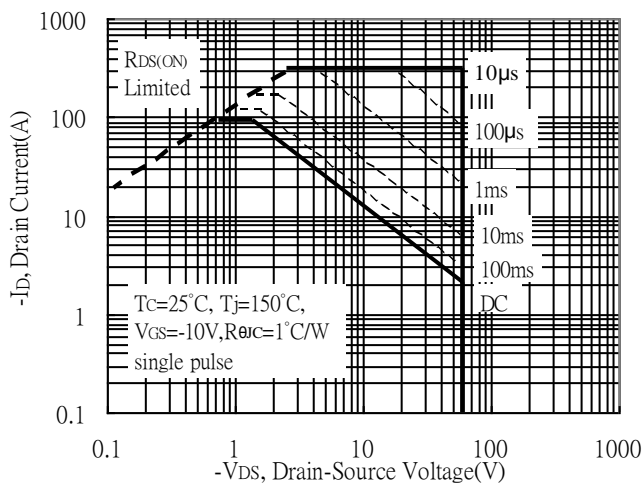
Forward Transfer Admittance vs Drain Current



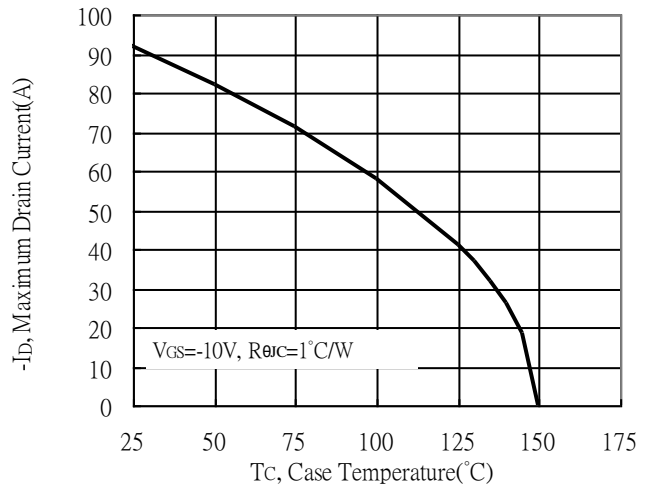
Gate Charge Characteristics



Maximum Safe Operating Area

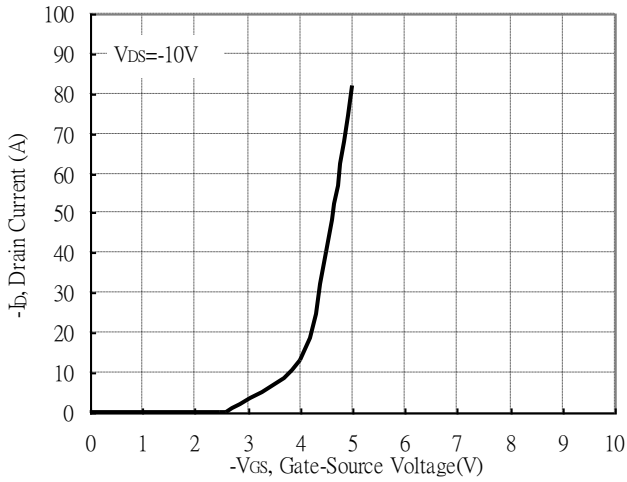


Maximum Drain Current vs Case Temperature

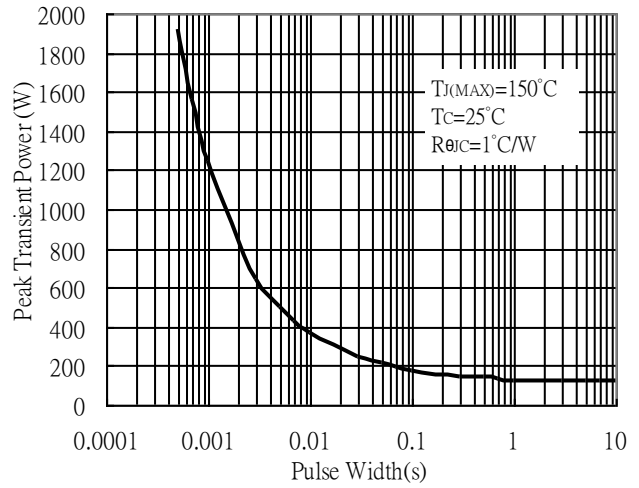


Typical Characteristics

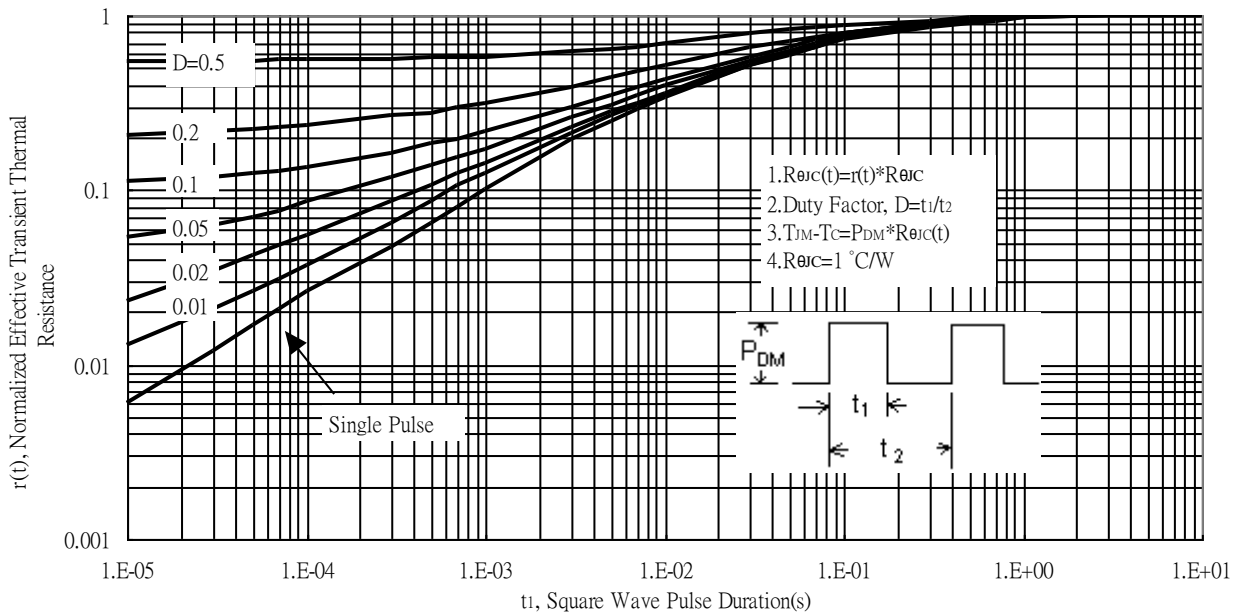
Typical Transfer Characteristics



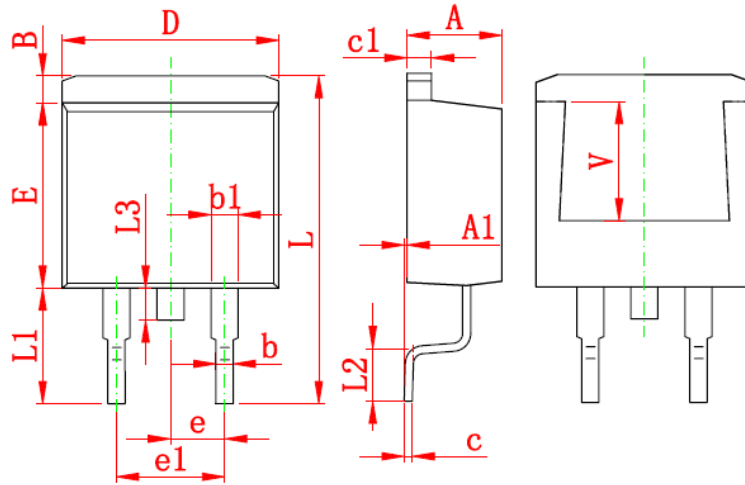
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves



TO-263 Package Information



\*:Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184	E	8.500	8.900	0.335	0.350
A1	0.000	0.150	0.000	0.006	e	*2.540		*0.100	
B	1.170	1.370	0.046	0.054	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	L	15.050	15.450	0.593	0.608
b1	1.170	1.370	0.046	0.054	L1	5.080	5.480	0.200	0.216
c	0.310	0.530	0.012	0.021	L2	2.340	2.740	0.092	0.108
c1	1.170	1.370	0.046	0.054	L3	1.300	1.700	0.051	0.067
D	10.010	10.310	0.394	0.406	V	5.600	REF	0.220	REF

Notes : 1.Controlling dimension : millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

Material :

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.