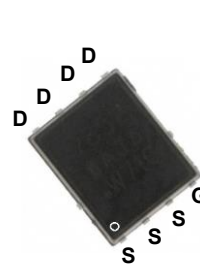
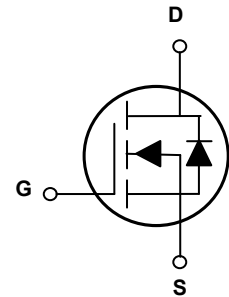


### Main Product Characteristics

$BV_{DSS}$	30V
$R_{DS(ON)}$	7.9m $\Omega$
$I_D$	55A



PPAK5X6



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The GSFP0356 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

### Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	55	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		35	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	220	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	45	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	30	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	47	W
Power Dissipation-Derate above $25^\circ\text{C}$		0.37	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.68	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

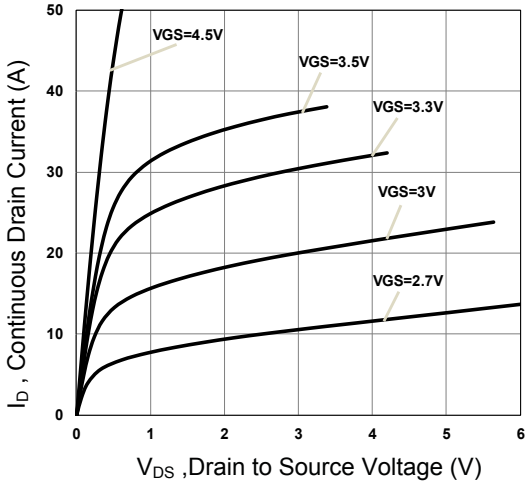
### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	6.6	7.9	m $\Omega$
		$V_{GS}=4.5V, I_D=6A$	-	9	11.7	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.6	2.5	V
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	20	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=15V, I_D=30A, V_{GS}=10V$	-	15	23	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	1.8	3	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	4	6	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=15V, R_G=6\Omega, V_{GS}=10V, I_D=30A$	-	5	7.5	nS
Rise Time <sup>3,4</sup>	$t_r$		-	13	20	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	28	42	
Fall Time <sup>3,4</sup>	$t_f$		-	8	12	
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	-	900	1350	pF
Output Capacitance	$C_{oss}$		-	130	200	
Reverse Transfer Capacitance	$C_{rss}$		-	110	170	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	55	A
Pulsed Source Current	$I_{SM}$		-	-	110	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	-	-	1	V
Reverse Recovery Time	$T_{rr}$	$V_R=30V, I_S=10A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	110	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	170	-	nC

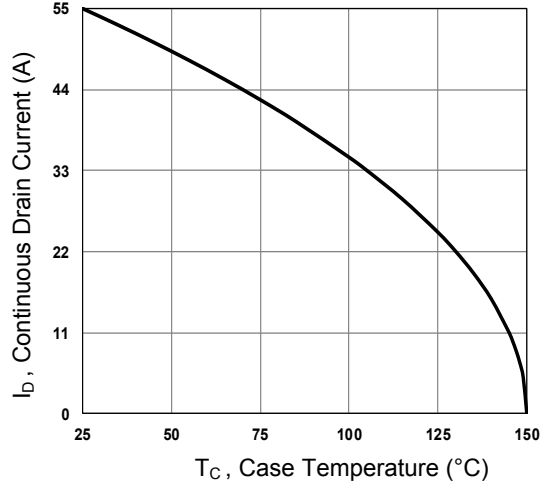
Note :

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=30A, R_G=25\Omega, \text{starting } T_J=25^{\circ}\text{C}$ .
3. Pulse test: pulse width  $\leq 300\mu s, \text{duty cycle} \leq 2\%$ .
4. Essentially independent of operation temperature.

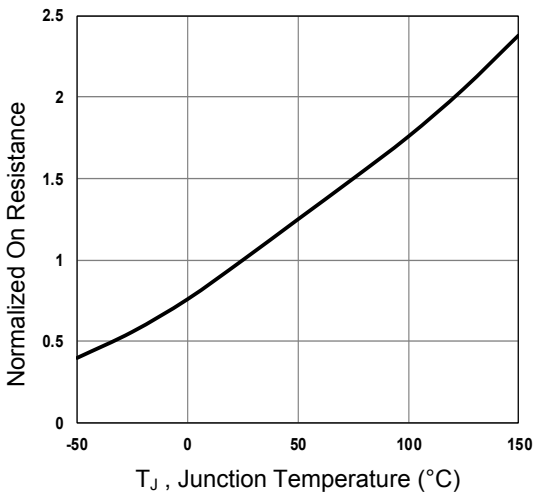
**Typical Electrical and Thermal Characteristic Curves**



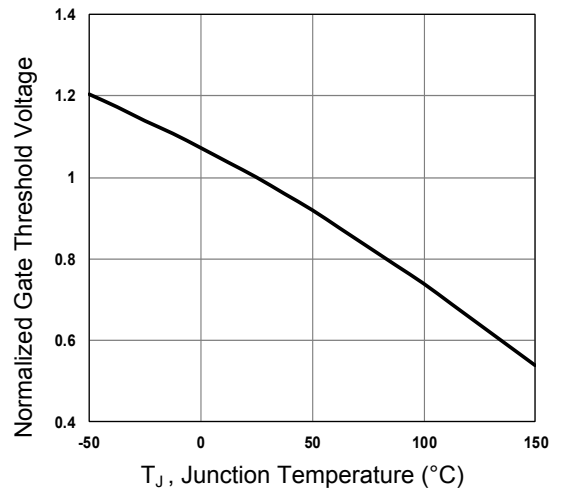
**Figure 1. Typical Output Characteristics**



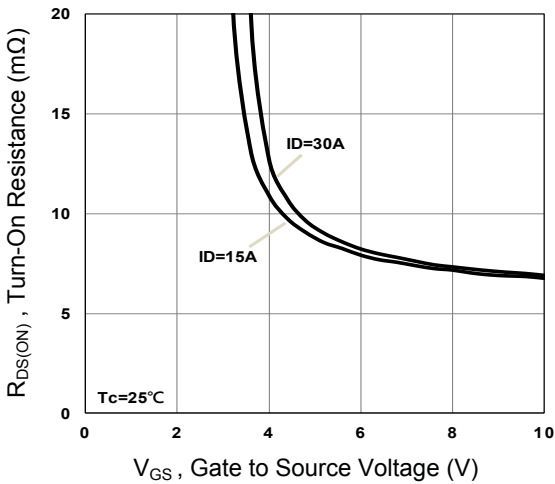
**Figure 2. Continuous Drain Current vs. T<sub>c</sub>**



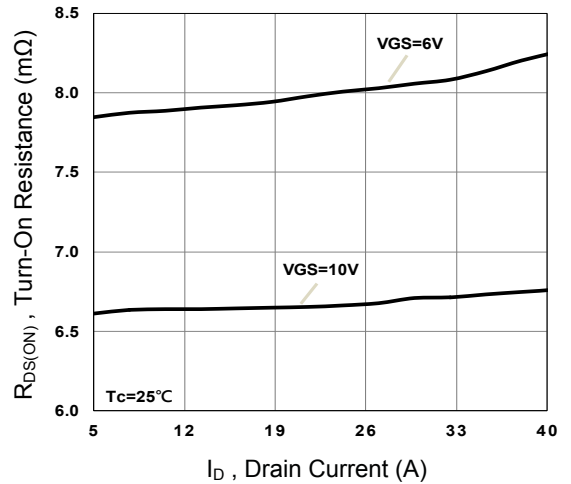
**Figure 3. Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>**



**Figure 4. Normalized V<sub>th</sub> vs. T<sub>J</sub>**

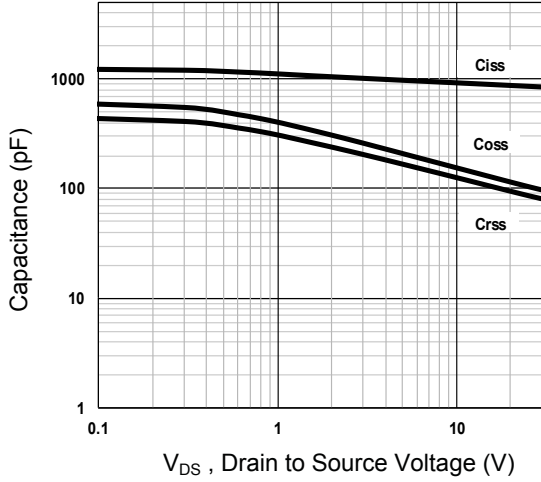


**Figure 5. Turn-On Resistance vs. V<sub>GS</sub>**

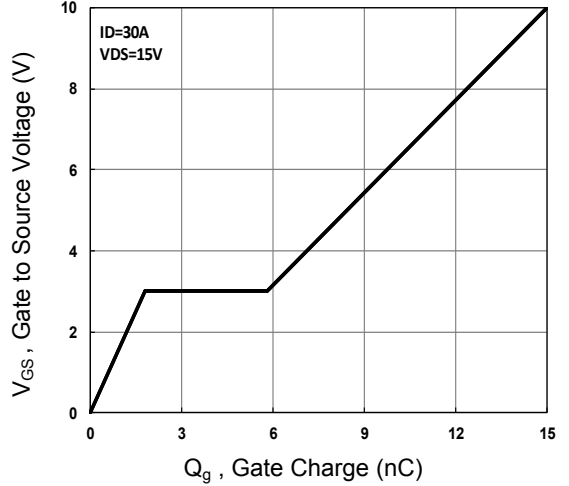


**Figure 6. Turn-On Resistance vs. I<sub>D</sub>**

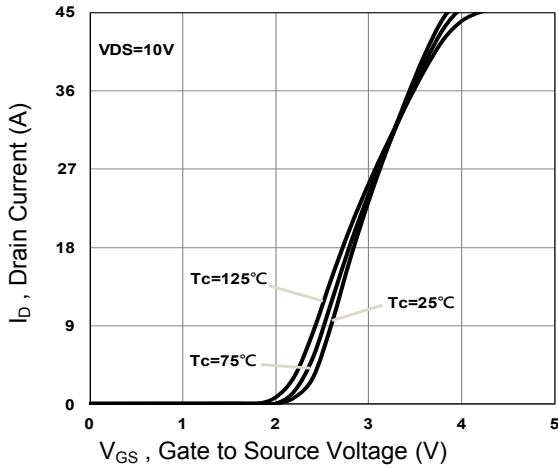
**Typical Electrical and Thermal Characteristic Curves**



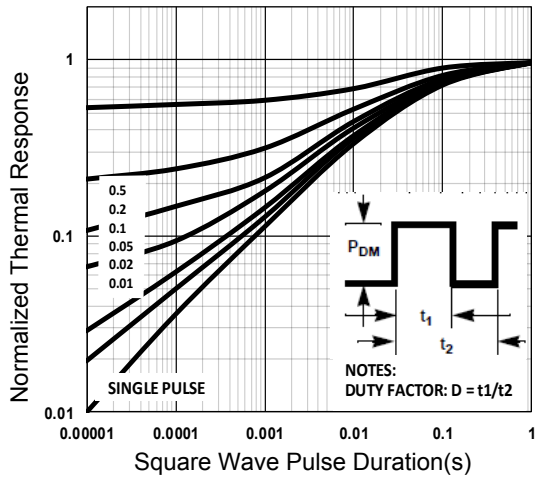
**Figure 7. Capacitance Characteristics**



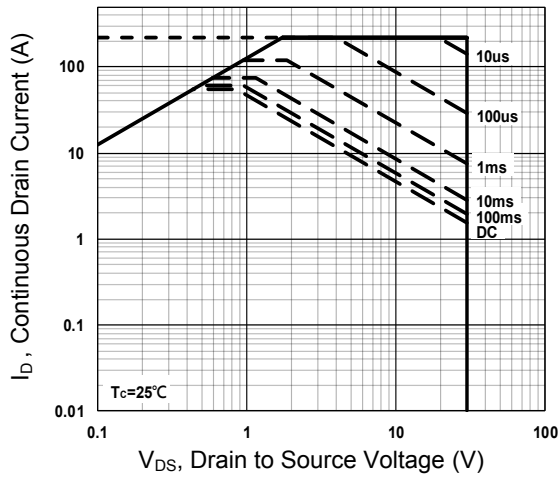
**Figure 8. Gate Charge Waveform**



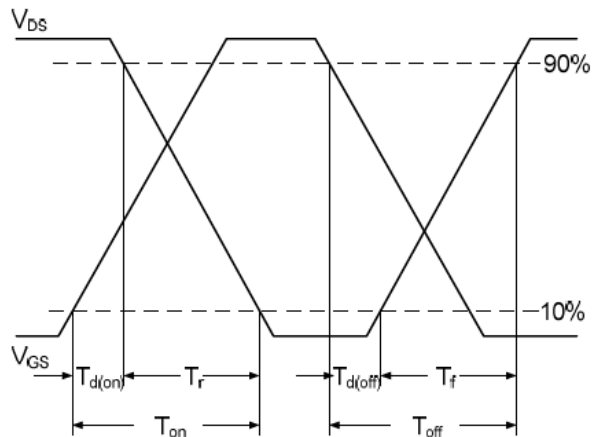
**Figure 9. Transfer Characteristics**



**Figure 10. Normalized Transient Impedance**



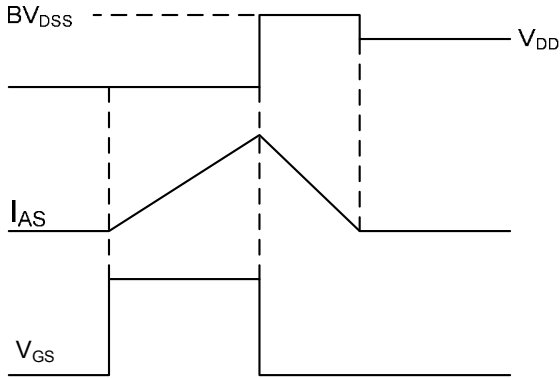
**Figure 11. Maximum Safe Operation Area**



**Figure 12. Switching Time Waveform**

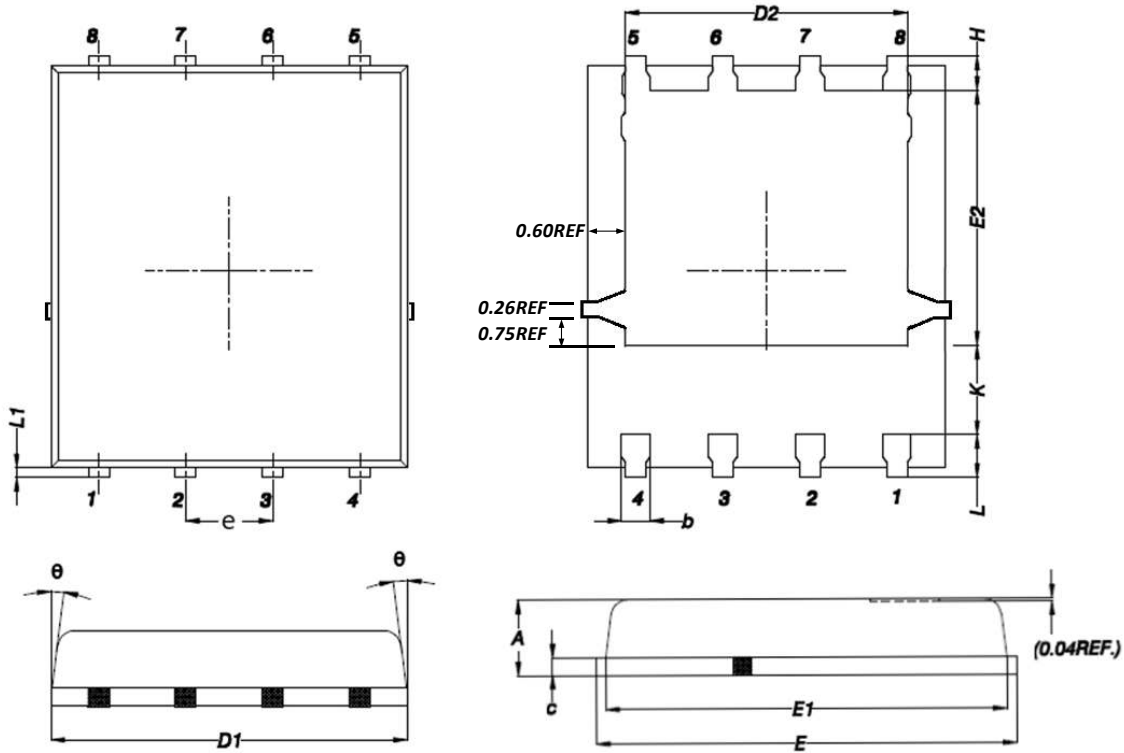
### Typical Electrical and Thermal Characteristic Curves

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



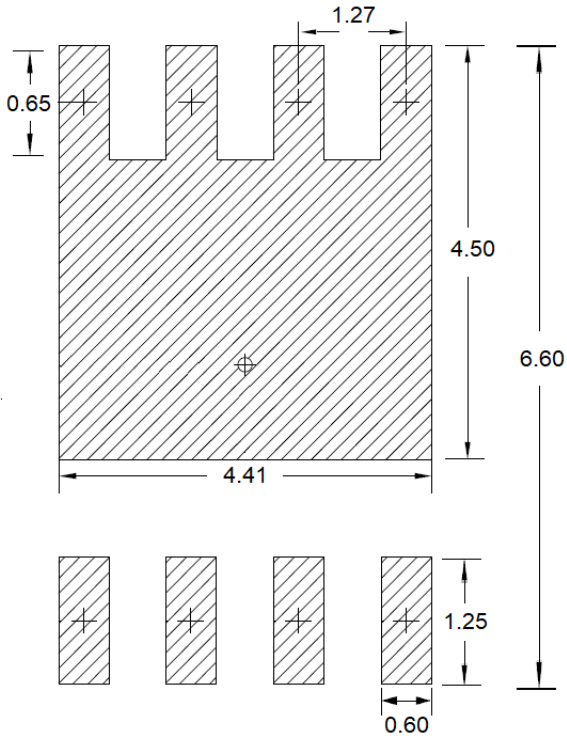
**Figure 13. EAS Waveform**

**Package Outline Dimensions (PPAK5x6)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.000	0.900	0.039	0.035
b	0.350	0.250	0.014	0.009
c	0.300	0.200	0.012	0.008
D1	5.400	5.000	0.213	0.197
D2	4.200	3.800	0.165	0.149
E	6.200	5.900	0.244	0.232
E1	5.700	5.400	0.224	0.212
E2	3.700	3.250	0.146	0.127
e	1.27BSC		0.05BSC	
H	0.750	0.550	0.030	0.022
K	---	1.100	---	0.043
L	0.680	0.480	0.027	0.018
L1	0.350	0.150	0.014	0.006
θ	12°	0°	12°	0°

**Recommended Pad Layout**



**Order Information**

Device	Package	Marking	Carrier	Quantity
GSFP0356	PPAK5x6	DC3944CX	Tape & Reel	3000pcs/Reel